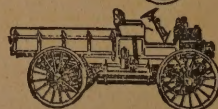
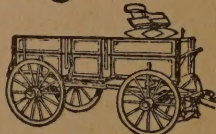
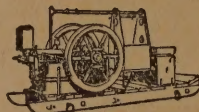
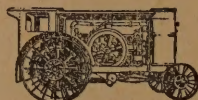
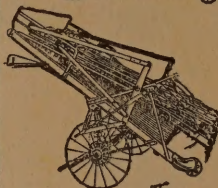
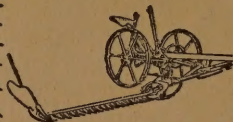
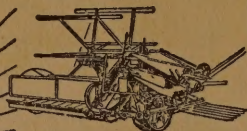
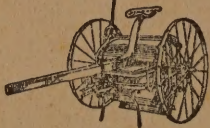
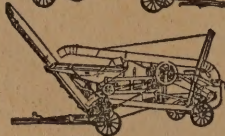
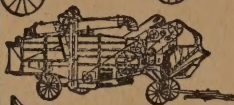
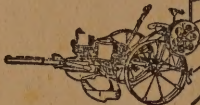
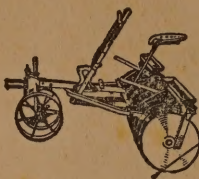


I H C ALMANAC





IHC LINE

GRAIN MACHINES

BINDERS
HEADERS
REAPERS
HEADER-BINDERS

HAY MACHINES

MOWERS
RAKES
HAY PRESSES
SWEEP RAKES
HAY LOADERS
STACKERS
TEDDERS
SIDE DELIVERY RAKES
COMBINED SWEEP RAKES
AND STACKERS

CORN MACHINES

PLANTERS
PICKERS
BINDERS
ENSILAGE CUTTERS
CORNSTALK RAKES
STALK CUTTERS
SHELLERS
CULTIVATORS
HUSKERS AND SHREDDERS

TILLAGE

DISK HARROWS
CULTIVATORS
SPRING-TOOTH HARROWS
PEG-TOOTH HARROWS
COMBINATION HARROWS

GENERAL LINE

MOTOR TRUCKS
FEED GRINDERS
KNIFE GRINDERS
BINDER TWINE
THRESHERS
STONE BURR MILLS
GRAIN DRILLS
CREAM SEPARATORS
OIL AND GAS ENGINES
MANURE SPREADERS
FERTILIZER SOWERS
OIL TRACTORS
FARM WAGONS AND TRUCKS

I H C ALMANAC

1915

AGRICULTURE always has been and always will be looked upon as the backbone of the industries of the world. During no time in the history of the world has the farmer occupied so responsible a position as that which he holds to-day. Never has he had more time and labor-saving machines at his disposal to better enable him to feed the world, and never has he needed them more than at the present time. The task of inducing each acre to yield more is the farmer's present-day problem.

This Almanac contains many helpful hints for the farmer and his household. It was prepared with a view toward giving the farmer, in brief form, such practical information as will prove of value in helping him solve this problem of to-day.

INTERNATIONAL HARVESTER COMPANY OF AMERICA
(INCORPORATED)
CHICAGO U S A

The degree of a man's success depends upon how he applies knowledge

Astronomical Calculations for the Year 1915

BY BERLIN H. WRIGHT, LAKE HELEN, FLORIDA.

Eras of Time

The Gregorian year 1915 corresponds to the following eras:
 The latter part of the 139th and the beginning of the 140th year of the Independence of the United States.
 The year 1333-4 of the Mohammedan era; the year 1334 begins November 9.
 The year 4612 (nearly) of the Chinese era, now beginning January 1.
 The year 8024 A. M. of the Greek church, beginning January 14.
 The year 5675-6 of the Jewish era; the year 5676 beginning at sunset September 8.
 The year 7423-4 of the Byzantine era, beginning September 1.
 The year 2575 of the Chinese era.
 January 1, 1915, is the 2,420,499th day since the beginning of the Julian Period.

Chronological Cycles

Dominical or Sunday Letter.....	C	Solar Cycle.....	20
Epact (Moon's Age, January 1).....	14	Jewish Lunar Cycle.....	13
Dionysian Period.....	244	Roman Indiction.....	13
Lunar Cycle (Golden Number).....	16	Julian Period.....	6628

The Seasons — Central Standard Time

SUN ENTERS			DATE		D.	H.	M.
SIG.	LONG.	CON.					
♊	270°	♊	Winter	begins, 1914, Dec. 22, 10:23 a. m. and lasts	89	0	28
♈	0°	♋	Spring	begins, 1915, Mar. 21, 10:51 a. m. and lasts	92	19	38
♊	90°	♋	Summer	begins, 1915, June 22, 6:29 a. m. and lasts	93	14	55
♏	180°	♏	Autumn	begins, 1915, Sept. 23, 9:24 p. m. and lasts	89	18	52
♏	270°	♊	Winter	begins, 1915, Dec. 22, 4:16 p. m. Trop. Yr365		5	53

Eclipses for the Year 1915

There will be two eclipses this year, both of the Sun as follows:

- I. Annular Feb. 14; invisible in America; visible in Africa, Indian Ocean, etc.
- II. Annular Aug. 10-11; invisible in America; visible in Pacific Ocean, Asia, etc.

NOTE: All eclipses occur in series, the first one of which will take place at one of the poles and the last at the opposite pole. The whole number in a series of Lunar eclipses covers a period of about 865 years and in the case of the Sun about 1200 years. Two is the least number possible in one year, when both must be of the Sun. Seven is the greatest number possible which will be the case in 1917 and 1935 when five will be of the Sun and two of the Moon.

Explanation of the Calendar Pages

All the calculations are based upon mean or clock time, except the Moon's Phases, which are in standard time. The Sun's rising and setting are for the upper limb, corrected for parallax and refraction. In the case of the Moon no correction is needed, as in the Sun, for "parallax and refraction" with her are of opposite nature and just balance each other. The figures given, therefore, are for the Moon's center on a true horizon, such as the ocean or a large plain affords.

The calculations in each of the geographical divisions of each calendar page will apply with sufficient accuracy to all places in the contiguous North American zones indicated by the headings of the divisions.

Although the 24-hour system of reckoning is used on some of the Canadian railways in order to reduce the chance of error in running trains, it has not been generally adopted.

Explanation of Signs on Calendar Pages

The signs used are as follows: ☌; conjunction or near approach; ☍, opposition or 180°, from the Sun; ☐, quadrature or 90°, from the Sun; ☉, Sun; ☷, Earth; ☿, Mercury; ♀, Venus; ♂, Mars; ♃, Jupiter; ♄, Saturn; ♅, Uranus; ♆, Neptune; ♎, Ascending Node; ♏, Descending Node; ☾, Moon generally.

*There is no mortal so happy as the man
who has made a success of farming*

Fixed and Movable Feasts or Church Days, Holidays and Anniversaries

Jan.	1—New Year's Day—Circumcision.	May	23—Pentecost (Whitsunday).
"	6—Epiphany—12th Day.	"	26, 28 and 29—Ember Days.
"	11—Alex. Hamilton's Birthday.	"	30—Memorial Day.
"	19—Lee's Birthday.	June	3—Corpus Christi
"	25—Conversion of St. Paul.	"	11—St. Barnabas.
"	29—McKinley's Birthday (Carnation Day).	"	14—Flag Day.
"	31—Septuagesima Sunday.	"	17—Bunker Hill Day (Mass.).
Feb.	2—Purification B. V. M. Candlemas, Groundhog Day.	"	24—Nativity of John the Baptist.
"	7—Sexagesima Sunday.	"	29—Peter and Paul, Chief Apostles.
"	12—Lincoln's Birthday.	July	4—Independence Day.
"	14—Quinquagesima (Shrove) Sunday.	"	12—Orangemen's Day.
"	14—St. Valentine's Day.	"	15—St. Swithen's Day.
"	16—Shrove Tuesday.	"	22—Mary Magdalene.
"	17—Ash Wednesday — Lent begins.	"	25—St. James.
"	21—Quadragesima Sunday.	Aug.	6—Transfiguration.
"	22—Washington's Birthday.	"	15—Feast of Assumption B. V. M.
"	24, 26 and 27—Ember Days.	"	24—St. Bartholomew
"	27—Longfellow's Birthday.	Sept.	6—Labor Day, generally.
"	28—March 1—Hebrew Purim.	"	8—Hebrew New Year begins at sunset.
March	14—Mid-Lent Sunday.	"	9—Hebrew New Year's Day.
"	15—Jackson's Birthday.	"	14—Exaltation of Holy Cross.
"	17—St. Patrick's Day.	"	15, 17 and 18—Ember Days.
"	25—Annunciation (Lady Day).	"	18—Hebrew Yom Kippur.
"	28—Palm Sunday.	"	21—St. Matthew.
"	30—1st Day of Hebrew Passover.	"	23—Hebrew Succoth.
April	2—Good Friday.	"	29—Michaelmas—St. John and all Angels.
"	4—Easter Sunday.	Oct.	18—St. Luke.
"	11—Low Sunday.	"	28—Simon and Jude.
"	13—Jefferson's Birthday.	"	31—Hallowe'en.
"	23—St. George.	Nov.	1—All Saints' Day.
"	25—St. Mark.	"	2—All Souls' Day.
"	27—Gen. Grant's Birthday.	"	9—Mohammedan New Year.
May	1—Philip and James—Dewey Day.	"	25—Thanksgiving Day.
"	7—Arbor Day.	"	28—Advent Sunday.
"	9—Rogation Sunday—Mothers' Day.	"	30—St. Andrew.
"	13—Ascension (Holy) Thursday.	Dec.	8—Feast of Immaculate Conception.)
"	18—Peace Day.	"	15, 17 and 18—Ember Days.
"	19—Hebrew Shebuoth.	"	21—St. Thomas
		"	25—Christmas Day.
		"	26—St. Stephen.
		"	27—St. John the Evangelist.
		"	28—Holy Innocents.

Domestic Prices Are Lower Than Foreign Prices

Last year a number of farmers requested and were furnished official proof that foreign prices were higher than domestic prices. The American farmer buys the Company's machines at lower prices than are paid anywhere else in the world. The charge that American harvesting machines are sold cheaper abroad than at home has often been conclusively and officially disproved. Senate Document No. 6, First Session 61st Congress disproves it. Consular reports 3414, 3420 and 3450 disprove it. And the Report of the Bureau of Corporations on the International Harvester Company says:

"The farmer in the United States enjoys a marked advantage over the farmers in foreign countries generally. The foreign price on grain binders is about 22 per cent greater than the domestic; on reapers, about 27 per cent; on mowers, about 11 per cent; on rakes about 20 per cent; and on twine, about 12 per cent.

"Because of frequent reports that the International Harvester Company has sold its machines at much lower prices abroad than at home, emphasis should be placed upon the fact that the Bureau's agents made an extensive investigation in Europe and found no noteworthy instances of what is usually termed 'dumping' with respect to the International Harvester Company." (pp. 244-245)

JANUARY

Moon's Phases	D.	Intercol. T.		Eastern T.		Central T.		Mountain T.		Pacific T.	
		H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
☾ Full Moon	1	8	20	7	20	6	20	5	20	4	20
☾ Last Quarter	8	5	13	4	13	3	13	2	13	1	13
☾ New Moon	15	10	42	9	42	8	42	7	42	6	42
☾ First Quarter	23	1	32	0	32	11	32†	10	32†	9	32†
☾ Full Moon	30	0	41*	11	41	10	41	9	41	8	41

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place		UNITED STATES									
					Northern States					Southern States				
			Sun Rises		Sun Sets		Moon R. & S.	Sun Rises		Sun Sets		Moon R. & S.		
			H.	M.	H.	M.		H.	M.	H.	M.		H.	M.
1	Fr.	☾	♊	7 25	4 43	4 51	7 03	5 06	5 16					
2	Sat.	☾	♊	7 25	4 44	5 56	7 03	5 07	6 18					
3	Sun.	☾	♊	7 25	4 45	7 04	7 03	5 07	7 21					
4	M.	☾	♊	7 25	4 46	8 12	7 04	5 08	8 23					
5	Tu.	☾	♊	7 25	4 47	9 20	7 04	5 09	9 26					
* 6	Wed.	☾	♊	7 25	4 48	10 29	7 04	5 10	10 30					
7	Th.	☾	♊	7 25	4 49	11 39	7 04	5 11	11 34					
8	Fr.	☾	♊	7 24	4 50	morn	7 04	5 11	morn					
9	Sat.	☾	♊	7 24	4 51	52	7 04	5 12	39					
10	Sun.	☾	♊	7 24	4 52	2 08	7 03	5 13	1 51					
11	M.	☾	♊	7 24	4 53	3 25	7 03	5 14	3 03					
12	Tu.	☾	♊	7 23	4 54	4 43	7 03	5 15	4 16					
13	Wed.	☾	♊	7 23	4 55	5 55	7 03	5 16	5 26					
14	Th.	☾	♊	7 23	4 56	6 54	7 03	5 17	6 26					
15	Fr.	☾	♊	7 22	4 57	sets	7 03	5 18	sets					
16	Sat.	☾	♊	7 22	4 59	6 24	7 02	5 19	6 40					
17	Sun.	☾	♊	7 21	5 00	7 34	7 02	5 20	7 45					
18	M.	☾	♊	7 21	5 01	8 41	7 02	5 21	8 46					
19	Tu.	☾	♊	7 21	5 02	9 46	7 01	5 21	9 46					
20	Wed.	☾	♊	7 20	5 03	10 49	7 01	5 22	10 44					
21	Th.	☾	♊	7 19	5 04	11 50	7 01	5 23	11 40					
† 22	Fr.	☾	♊	7 18	5 05	morn	7 00	5 24	morn					
23	Sat.	☾	♊	7 17	5 07	51	7 00	5 25	36					
24	Sun.	☾	♊	7 17	5 08	1 53	6 59	5 26	1 33					
25	M.	☾	♊	7 16	5 09	2 54	6 59	5 27	2 30					
26	Tu.	☾	♊	7 16	5 10	3 55	6 58	5 28	3 28					
27	Wed.	☾	♊	7 15	5 11	4 52	6 58	5 29	4 23					
28	Th.	☾	♊	7 14	5 13	5 44	6 57	5 30	5 15					
29	Fr.	☾	♊	7 13	5 14	6 28	6 56	5 31	6 03					
30	Sat.	☾	♊	7 12	5 15	rises	6 56	5 32	rises					
* 31	Sun.	☾	♊	7 12	5 16	6 00	6 55	5 33	6 14					

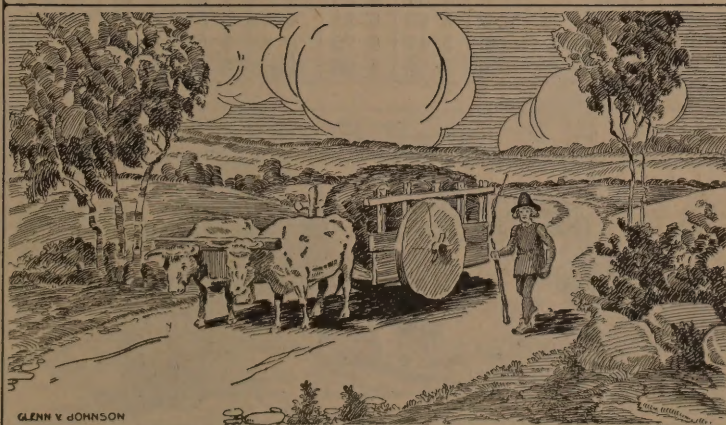


Carrying grain in ancient Egypt

FEBRUARY

Moon's Phases	Intercol. T.	Eastern T.	Central T.	Mountain T.	Pacific T.
☾ Last Quarter	7 11	0 11	11 11*	10 11*	9 11*
☾ New Moon	13 0	11 31†	10 31	9 31	8 31
☾ First Quarter	21 10	58 9	58 8	58 7	58 6

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place		UNITED STATES											
			Sign	Con.	Northern States						Southern States					
					Sun Rises	Sun Sets	Moon R. & S.		Sun Rises	Sun Sets	Moon R. & S.		Sun Rises	Sun Sets	Moon R. & S.	
					H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1	M.	☾	♊	♊	7 11	5 18	7 10	6 54	5 34	7 18						
2	Tu.	☾	♊	♊	7 10	5 19	8 20	6 54	5 35	8 22						
3	Wed.	☾	♊	♊	7 09	5 20	9 31	6 53	5 36	9 27						
4	Th.	☾	♊	♊	7 07	5 21	10 44	6 52	5 37	10 34						
5	Fr.	☾	♊	♊	7 06	5 22	11 57	6 51	5 38	11 42						
* 6	Sat.	☾	♊	♊	7 05	5 23	morn	6 51	5 38	morn						
7	Sun.	☾	♊	♊	7 04	5 25	1 14	6 50	5 39	53						
8	M.	☾	♊	♊	7 03	5 26	2 30	6 49	5 40	2 05						
9	Tu.	☾	♊	♊	7 02	5 27	3 42	6 48	5 41	3 14						
10	Wed.	☾	♊	♊	7 01	5 28	4 44	6 47	5 42	4 16						
11	Th.	☾	♊	♊	7 00	5 30	5 34	6 46	5 43	5 09						
12	Fr.	☾	♊	♊	6 58	5 31	6 15	6 45	5 44	5 53						
13	Sat.	☾	♊	♊	6 57	5 32	6 45	6 44	5 45	6 29						
† 14	Sun.	☾	♊	♊	6 56	5 34	sets	6 43	5 46	sets						
15	M.	☾	♊	♊	6 55	5 35	7 29	6 42	5 46	7 31						
16	Tu.	☾	♊	♊	6 53	5 36	8 33	6 41	5 47	8 30						
17	Wed.	☾	♊	♊	6 52	5 37	9 35	6 40	5 48	9 27						
18	Th.	☾	♊	♊	6 51	5 39	10 37	6 39	5 49	10 24						
19	Fr.	☾	♊	♊	6 49	5 40	11 39	6 38	5 50	11 22						
20	Sat.	☾	♊	♊	6 48	5 41	morn	6 37	5 51	morn						
21	Sun.	☾	♊	♊	6 46	5 43	40	6 36	5 52	18						
22	M.	☾	♊	♊	6 45	5 44	1 42	6 36	5 52	1 16						
23	Tu.	☾	♊	♊	6 44	5 45	2 40	6 35	5 53	2 11						
24	Wed.	☾	♊	♊	6 42	5 46	3 34	6 34	5 54	3 05						
25	Th.	☾	♊	♊	6 41	5 48	4 20	6 33	5 55	3 53						
26	Fr.	☾	♊	♊	6 39	5 49	5 01	6 32	5 56	4 37						
27	Sat.	☾	♊	♊	6 38	5 50	5 36	6 31	5 57	5 17						
28	Sun.	☾	♊	♊	6 37	5 51	6 04	6 30	5 57	5 51						



Ox cart used in England (800 A. D.)

MARCH

Moon's Phases		Intercol.		Eastern T.		Central T.		Mountain T.		Pacific T.	
	D.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
☉ Full Moon	1	2	33	1	33	0	33	11	33	10	33
☾ Last Quarter	8	8	28	7	28	6	28	5	28	4	28
☾ New Moon	15	3	42	2	42	1	42	0	42	11	42
☾ First Quarter	23	6	48	5	48	4	48	3	48	2	48
☾ Full Moon	30	1	38	0	38	11	38*	10	38*	9	38*

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place	UNITED STATES											
				Northern States						Southern States					
				Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.
			Sign	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1	M.	☾	♊	6 35	5 53	6 03	6 28	5 58	6 08	6 28	5 58	6 08	6 28	5 58	6 08
2	Tu.	☾	♊	6 34	5 53	7 15	6 27	5 58	7 13	6 27	5 58	7 13	6 27	5 58	7 13
3	Wed.	☾	♋	6 32	5 54	8 30	6 26	5 59	8 22	6 26	5 59	8 22	6 26	5 59	8 22
4	Th.	☾	♋	6 30	5 55	9 44	6 25	6 00	9 31	6 25	6 00	9 31	6 25	6 00	9 31
5	Fr.	☾	♋	6 29	5 56	10 59	6 24	6 01	10 43	6 24	6 01	10 43	6 24	6 01	10 43
6	Sat.	☾	♋	6 27	5 57	morn	6 23	6 01	11 56	6 23	6 01	11 56	6 23	6 01	11 56
7	Sun.	☾	♌	6 25	5 58	21	6 22	6 02	morn	6 22	6 02	morn	6 22	6 02	morn
8	M.	☾	♌	6 24	5 59	1 34	6 21	6 03	1 06	6 21	6 03	1 06	6 21	6 03	1 06
9	Tu.	☾	♌	6 22	6 00	2 40	6 20	6 03	2 11	6 20	6 03	2 11	6 20	6 03	2 11
10	Wed.	☾	♍	6 20	6 01	3 32	6 19	6 04	3 05	6 19	6 04	3 05	6 19	6 04	3 05
11	Th.	☾	♍	6 19	6 02	4 19	6 17	6 05	3 54	6 17	6 05	3 54	6 17	6 05	3 54
12	Fr.	☾	♍	6 17	6 03	4 48	6 16	6 06	4 30	6 16	6 06	4 30	6 16	6 06	4 30
13	Sat.	☾	♍	6 16	6 04	5 13	6 14	6 06	5 01	6 14	6 06	5 01	6 14	6 06	5 01
14	Sun.	☾	♎	6 15	6 05	5 37	6 13	6 07	5 30	6 13	6 07	5 30	6 13	6 07	5 30
15	M.	☾	♎	6 12	6 06	sets	6 11	6 08	sets	6 11	6 08	sets	6 11	6 08	sets
16	Tu.	☾	♏	6 11	6 08	7 21	6 10	6 09	7 16	6 10	6 09	7 16	6 10	6 09	7 16
17	Wed.	☾	♏	6 09	6 09	8 22	6 09	6 09	8 11	6 09	6 09	8 11	6 09	6 09	8 11
18	Th.	☾	♏	6 07	6 10	9 26	6 08	6 10	9 10	6 08	6 10	9 10	6 08	6 10	9 10
19	Fr.	☾	♏	6 06	6 11	10 27	6 06	6 11	10 06	6 06	6 11	10 06	6 06	6 11	10 06
20	Sat.	☾	♏	6 04	6 12	11 29	6 05	6 11	11 04	6 05	6 11	11 04	6 05	6 11	11 04
21	Sun.	☾	♐	6 02	6 13	morn	6 03	6 12	morn	6 03	6 12	morn	6 03	6 12	morn
22	M.	☾	♐	6 01	6 14	29	6 02	6 13	01	6 02	6 13	01	6 02	6 13	01
23	Tu.	☾	♐	5 59	6 15	1 24	6 01	6 14	56	6 01	6 14	56	6 01	6 14	56
24	Wed.	☾	♐	5 58	6 16	2 13	5 59	6 14	1 45	5 59	6 14	1 45	5 59	6 14	1 45
25	Th.	☾	♐	5 56	6 17	2 56	5 58	6 15	2 30	5 58	6 15	2 30	5 58	6 15	2 30
26	Fr.	☾	♐	5 54	6 18	3 33	5 57	6 16	3 11	5 57	6 16	3 11	5 57	6 16	3 11
27	Sat.	☾	♐	5 52	6 19	4 03	5 56	6 16	3 47	5 56	6 16	3 47	5 56	6 16	3 47
28	Sun.	☾	♑	5 51	6 20	4 29	5 55	6 17	4 18	5 55	6 17	4 18	5 55	6 17	4 18
29	M.	☾	♑	5 49	6 21	4 53	5 54	6 18	4 48	5 54	6 18	4 48	5 54	6 18	4 48
*30	Tu.	☾	♑	5 47	6 22	5 18	5 52	6 18	5 20	5 52	6 18	5 20	5 52	6 18	5 20
31	Wed.	☾	♑	5 45	6 23	rises	5 50	6 19	rises	5 50	6 19	rises	5 50	6 19	rises



Ancient methods of storing grain

APRIL

Moon's Phases	Intercol T.	Eastern T.	Central T.	Mountain T.	Pacific T.
☾ Last Quarter	D. 6	H. 4 M. 12	H. 3 M. 12	H. 1 M. 12	H. 6 M. 12
● New Moon	14	7 36	6 36	4 36	3 36
☾ First Quarter	22	11 39	10 39	8 39	7 39
☾ Full Moon	29	10 19	9 19	7 19	6 19

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign Con.	UNITED STATES									
				Northern States						Southern States			
				Sun Rises		Sun Sets		Moon R. & S.		Sun Rises		Sun Sets	
H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	Th.	☾	♈	5 44	6 24	8 42	5 47	6 21	8 25				
2	Fr.	☾	♈	5 42	6 26	10 02	5 45	6 21	9 40				
3	Sat.	☾	♈	5 41	6 27	11 21	5 44	6 22	10 54				
4	Sun.	☾	♈	5 39	6 28	morn	5 43	6 23	morn				
5	M.	☾	♈	5 37	6 29	30	5 41	6 24	03				
6	Tu.	☾	♈	5 36	6 30	1 29	5 40	6 25	1 01				
7	Wed.	☾	♈	5 34	6 31	2 14	5 39	6 26	1 50				
8	Th.	☾	♈	5 33	6 32	2 49	5 38	6 26	2 30				
9	Fr.	☾	♈	5 31	6 33	3 17	5 36	6 27	3 03				
10	Sat.	☾	♈	5 30	6 34	3 42	5 35	6 28	3 33				
11	Sun.	☾	♈	5 28	6 35	4 03	5 34	6 29	3 59				
12	M.	☾	♈	5 26	6 36	4 23	5 33	6 29	4 25				
13	Tu.	☾	♈	5 25	6 37	4 44	5 31	6 30	5 51				
14	Wed.	☾	♈	5 24	6 38	sets	5 30	6 31	sets				
15	Th.	☾	♈	5 22	6 39	8 16	5 29	6 31	7 58				
16	Fr.	☾	♈	5 20	6 40	9 18	5 28	6 32	8 55				
17	Sat.	☾	♈	5 19	6 41	10 19	5 27	6 33	9 53				
18	Sun.	☾	♈	5 17	6 42	11 16	5 25	6 33	10 47				
19	M.	☾	♈	5 16	6 43	morn	5 24	6 34	11 39				
20	Tu.	☾	♈	5 14	6 44	08	5 23	6 35	morn				
21	Wed.	☾	♈	5 13	6 45	51	5 22	6 36	25				
22	Th.	☾	♈	5 11	6 46	1 29	5 21	6 36	1 07				
23	Fr.	☾	♈	5 10	6 47	2 02	5 20	6 37	1 44				
24	Sat.	☾	♈	5 08	6 48	2 29	5 19	6 38	2 16				
25	Sun.	☾	♈	5 07	6 49	2 53	5 18	6 39	2 46				
26	M.	☾	♈	5 06	6 50	3 18	5 17	6 39	3 16				
27	Tu.	☾	♈	5 04	6 51	3 41	5 16	6 40	3 46				
28	Wed.	☾	♈	5 03	6 52	4 07	5 15	6 40	4 18				
29	Th.	☾	♈	5 02	6 53	rises	5 14	6 41	rises				
30	Fr.	☾	♈	5 00	6 55	8 57	5 13	6 41	8 32				



Transporting grain by camels

MAY

Moon's Phases		Intercol. T.		Eastern T.		Central T.		Mountain T.		Pacific T.	
	D.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
☾ Last Quarter	6	1	23	0	23	11	23*	10	23*	9	23*
● New Moon	13	11	31	10	31	9	31	8	31	7	31
☾ First Quarter	21	0	50†	11	50	10	50	9	50	8	50
☾ Full Moon	28	5	33	4	33	3	33	2	33	1	33

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign	Moon's Con.	UNITED STATES									
					Northern States					Southern States				
					Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.	Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.				
1	Sat.	☾	♊	♍	4 59	6 56	10 14	5 12	6 42	9 46				
2	Sun.	☾	♊	♍	4 58	6 57	11 19	5 11	6 43	10 51				
3	M.	☾	♊	♍	4 56	6 58	morn	5 10	6 44	11 46				
4	Tu.	☾	♊	♍	4 55	6 59		5 09	6 44	morn				
*5	Wed.	☾	♊	♍	4 54	7 00		5 08	6 45		29			
6	Th.	☾	♊	♍	4 53	7 01	1 21	5 07	6 46		1 06			
7	Fr.	☾	♊	♍	4 52	7 02	1 46	5 06	6 47		1 36			
8	Sat.	☾	♊	♍	4 51	7 03	2 09	5 05	6 47		2 04			
9	Sun.	☾	♊	♍	4 49	7 04	2 29	5 04	6 48		2 29			
10	M.	☾	♊	♍	4 48	7 05	2 49	5 03	6 49		2 54			
11	Tu.	☾	♊	♍	4 47	7 06	3 11	5 03	6 50		3 21			
12	Wed.	☾	♊	♍	4 46	7 07	3 35	5 02	6 50		3 50			
13	Th.	☾	♊	♍	4 45	7 08	4 10	5 01	6 51		4 20			
14	Fr.	☾	♊	♍	4 44	7 09	sets	5 01	6 52	sets				
15	Sat.	☾	♊	♍	4 43	7 10	9 12	5 00	6 52		8 44			
16	Sun.	☾	♊	♍	4 42	7 11	10 03	4 59	6 53		9 34			
17	M.	☾	♊	♍	4 41	7 12	10 49	4 59	6 54		10 22			
18	Tu.	☾	♊	♍	4 40	7 13	11 29	4 58	6 54		11 05			
19	Wed.	☾	♊	♍	4 39	7 14	morn	4 58	6 55		11 42			
20	Th.	☾	♊	♍	4 39	7 15	01	4 57	6 56	morn				
21	Fr.	☾	♊	♍	4 38	7 16	30	4 56	6 56		15			
†22	Sat.	☾	♊	♍	4 37	7 17	55	4 56	6 57		46			
23	Sun.	☾	♊	♍	4 36	7 18	1 18	4 55	6 58		1 14			
24	M.	☾	♊	♍	4 36	7 19	1 41	4 55	6 58		1 43			
25	Tu.	☾	♊	♍	4 35	7 20	2 05	4 55	6 59		2 13			
26	Wed.	☾	♊	♍	4 34	7 20	2 32	4 54	7 00		2 46			
27	Th.	☾	♊	♍	4 34	7 21	3 08	4 54	7 00		3 27			
28	Fr.	☾	♊	♍	4 33	7 22	rises	4 53	7 01	rises				
29	Sat.	☾	♊	♍	4 32	7 23	9 00	4 53	7 02		8 31			
30	Sun.	☾	♊	♍	4 32	7 23	10 00	4 53	7 02		9 33			
31	M.	☾	♊	♍	4 31	7 24	10 56	4 53	7 03		10 33			



Balboa discovering the Pacific

JUNE

Moon's Phases	Intercol. T.	Eastern T.	Central T.	Mountain T.	Pacific T.
c Last Quarter	D 4	H. M.	H. M.	H. M.	H. M.
• New Moon	12	0 32	1 32	9 32	8 32
☾ First Quarter	20	2 57	0 57	11 57	10 57
☾ Full Moon	26	10 24	9 24	7 24	6 24
	26	0 27*	11 27	10 27	8 27

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign	Moon's Place Con.	UNITED STATES					
					Northern States			Southern States		
					Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.	Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.
1	Tu.	☾	♊	♊	4 31	7 24	11 21	4 52	7 03	11 03
2	Wed.	☾	♊	♊	4 30	7 25	11 49	4 52	7 04	11 37
3	Th.	☾	♊	♊	4 30	7 26	morn	4 52	7 04	morn
4	Fr.	☾	♊	♊	4 30	7 26	12	4 52	7 05	06
5	Sat.	☾	♊	♊	4 29	7 27	34	4 51	7 05	32
6	Sun.	☾	♊	♊	4 29	7 28	54	4 51	7 06	58
7	M.	☾	♊	♊	4 29	7 28	1 17	4 51	7 06	1 25
8	Tu.	☾	♊	♊	4 29	7 29	1 38	4 51	7 07	1 52
9	Wed.	☾	♊	♊	4 28	7 30	2 04	4 51	7 07	2 22
10	Th.	☾	♊	♊	4 28	7 30	2 35	4 51	7 08	2 57
11	Fr.	☾	♊	♊	4 28	7 31	3 12	4 51	7 08	3 39
12	Sat.	☾	♊	♊	4 28	7 31	3 55	4 51	7 09	4 23
13	Sun.	☾	♊	♊	4 28	7 32	sets	4 51	7 09	sets
14	M.	☾	♊	♊	4 28	7 32	9 28	4 51	7 09	9 03
15	Tu.	☾	♊	♊	4 28	7 32	10 03	4 51	7 10	9 42
16	Wed.	☾	♊	♊	4 28	7 33	10 34	4 51	7 10	10 18
17	Th.	☾	♊	♊	4 28	7 33	10 59	4 52	7 10	10 48
18	Fr.	☾	♊	♊	4 28	7 33	11 22	4 52	7 11	11 17
19	Sat.	☾	♊	♊	4 28	7 34	11 43	4 52	7 11	11 43
20	Sun.	☾	♊	♊	4 29	7 34	morn	4 52	7 11	morn
21	M.	☾	♊	♊	4 29	7 34	07	4 52	7 11	12
22	Tu.	☾	♊	♊	4 29	7 34	32	4 53	7 11	44
23	Wed.	☾	♊	♊	4 29	7 35	1 01	4 53	7 11	1 18
24	Th.	☾	♊	♊	4 29	7 35	1 36	4 53	7 12	1 59
25	Fr.	☾	♊	♊	4 30	7 35	2 24	4 54	7 12	2 50
26	Sat.	☾	♊	♊	4 30	7 35	rises	4 54	7 12	rises
*27	Sun.	☾	♊	♊	4 30	7 35	8 35	4 54	7 12	8 10
28	M.	☾	♊	♊	4 31	7 35	9 16	4 55	7 12	8 56
29	Tu.	☾	♊	♊	4 31	7 35	9 48	4 55	7 12	9 33
30	Wed.	☾	♊	♊	4 31	7 35	10 14	4 55	7 12	10 05

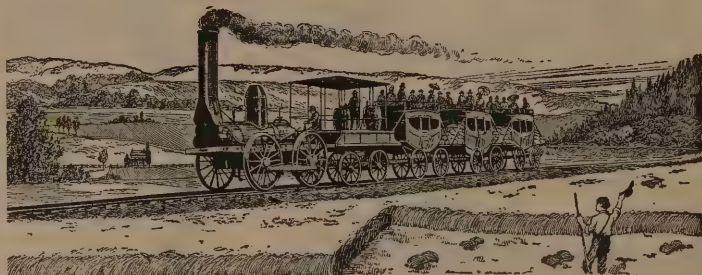


Wagon used in Colonial days

JULY

Moon's Phases		Intercol. T.		Eastern T.		Central T.		Mountain T.		Pacific T.	
	D.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
c Last Quarter	4	1	54	0	54	11	54*	10	54*	9	54
• New Moon	12	5	31	4	31	3	31	2	31	1	31
o First Quarter	19	5	9	4	9	3	9	2	9	1	9
© Full Moon	26	8	11	7	11	6	11	5	11	4	11

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place	UNITED STATES									
				Northern States					Southern States				
				Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises
1	Th.	☉	♊	4 32	7 35	10 37	4 56	7 12	10 34				
2	Fr.	☉	♊	4 32	7 35	10 48	4 56	7 12	10 50				
*3	Sat.	☉	♊	4 33	7 34	11 20	4 57	7 12	11 27				
4	Sun.	☉	♊	4 33	7 34	11 41	4 57	7 12	11 53				
5	M.	☉	♊	4 34	7 34	morn	4 58	7 11	morn				
6	Tu.	☉	♊	4 35	7 34	06	4 58	7 11	23				
7	Wed.	☉	♊	4 35	7 33	35	4 59	7 11	57				
8	Th.	☉	♊	4 36	7 33	1 09	4 59	7 11	1 35				
9	Fr.	☉	♊	4 37	7 33	1 51	5 00	7 11	2 19				
10	Sat.	☉	♊	4 37	7 32	2 41	5 00	7 10	3 09				
11	Sun.	☉	♊	4 38	7 32	3 34	5 01	7 10	4 03				
12	M.	☉	♊	4 39	7 31	sets	5 01	7 10	sets				
13	Tu.	☉	♊	4 39	7 31	8 37	5 02	7 09	8 19				
14	Wed.	☉	♊	4 40	7 30	9 03	5 03	7 09	8 51				
15	Th.	☉	♊	4 41	7 30	9 27	5 03	7 09	9 20				
16	Fr.	☉	♊	4 42	7 29	9 49	5 04	7 08	9 47				
17	Sat.	☉	♊	4 43	7 29	10 11	5 04	7 08	10 15				
18	Sun.	☉	♊	4 44	7 28	10 36	5 05	7 07	10 46				
19	M.	☉	♊	4 44	7 27	11 01	5 06	7 07	11 16				
20	Tu.	☉	♊	4 45	7 26	11 35	5 06	7 06	11 55				
21	Wed.	☉	♊	4 46	7 26	morn	5 07	7 06	morn				
22	Th.	☉	♊	4 47	7 25	14	5 08	7 05	40				
23	Fr.	☉	♊	4 48	7 24	1 07	5 08	7 04	1 35				
24	Sat.	☉	♊	4 48	7 23	2 12	5 09	7 04	2 40				
25	Sun.	☉	♊	4 49	7 23	3 28	5 10	7 03	3 53				
26	M.	☉	♊	4 50	7 22	rises	5 10	7 03	rises				
27	Tu.	☉	♊	4 51	7 21	8 14	5 11	7 02	8 03				
28	Wed.	☉	♊	4 52	7 20	8 38	5 12	7 01	8 32				
29	Th.	☉	♊	4 53	7 19	9 00	5 12	7 00	9 00				
30	Fr.	☉	♊	4 54	7 18	9 21	5 13	6 59	9 27				
31	Sat.	☉	♊	4 55	7 17	9 44	5 14	6 59	9 54				



Early Transportation by Steam

AUGUST

Moon's Phases	Intercol. T.	Eastern T.	Central T.	Mountain T.	Pacific T.
☾ Last Quarter	2 27	4 27	3 27	2 27	1 27
● New Moon	10 52	5 52	4 52	3 52	2 52
☽ First Quarter	17 10	9 17	8 17	7 17	6 17
☾ Full Moon	24 5	4 40	3 40	2 40	1 40

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign	Moon's Place Con.	UNITED STATES								
					Northern States			Southern States			Moon R. & S.		
					Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.	Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.			
1	Sun.	☾	♊	♊	4 56	7 16	10 08	5 14	6 58	10 23			
2	M.	☾	♊	♊	4 57	7 14	10 35	5 15	6 57	10 55			
3	Tu.	☾	♊	♊	4 58	7 13	11 08	5 16	6 56	11 32			
4	Wed.	☾	♊	♊	4 59	7 12	11 46	5 16	6 55	morn			
5	Th.	☾	♊	♊	5 00	7 10	morn	5 17	6 54	13			
6	Fr.	☾	♊	♊	5 01	7 09	33	5 18	6 53	1 02			
7	Sat.	☾	♊	♊	5 02	7 07	1 26	5 18	6 52	1 54			
8	Sun.	☾	♊	♊	5 03	7 06	2 27	5 19	6 51	2 53			
9	M.	☾	♊	♊	5 04	7 05	3 30	5 20	6 50	3 52			
10	Tu.	☾	♊	♊	5 05	7 04	4 36	5 21	6 49	4 53			
11	Wed.	☾	♊	♊	5 06	7 02	sets	5 21	6 48	sets			
12	Th.	☾	♊	♊	5 07	7 01	7 54	5 22	6 47	7 51			
13	Fr.	☾	♊	♊	5 08	7 00	8 18	5 22	6 46	8 20			
14	Sat.	☾	♊	♊	5 09	6 58	8 40	5 23	6 45	8 48			
15	Sun.	☾	♊	♊	5 10	6 57	9 06	5 24	6 44	9 19			
16	M.	☾	♊	♊	5 11	6 55	9 36	5 25	6 43	9 55			
17	Tu.	☾	♊	♊	5 12	6 54	10 13	5 25	6 42	10 37			
18	Wed.	☾	♊	♊	5 13	6 53	11 01	5 26	6 41	11 28			
19	Th.	☾	♊	♊	5 14	6 51	11 59	5 27	6 40	morn			
20	Fr.	☾	♊	♊	5 15	6 50	morn	5 27	6 39	28			
21	Sat.	☾	♊	♊	5 16	6 48	1 08	5 28	6 37	1 34			
22	Sun.	☾	♊	♊	5 17	6 47	2 23	5 29	6 36	2 46			
23	M.	☾	♊	♊	5 17	6 45	3 41	5 29	6 35	3 58			
24	Tu.	☾	♊	♊	5 18	6 49	rises	5 30	6 34	rises			
25	Wed.	☾	♊	♊	5 19	6 42	7 02	5 31	6 33	6 59			
26	Th.	☾	♊	♊	5 20	6 41	7 24	5 31	6 31	7 26			
27	Fr.	☾	♊	♊	5 21	6 39	7 46	5 32	6 30	7 54			
28	Sat.	☾	♊	♊	5 22	6 37	8 09	5 33	6 29	8 22			
29	Sun.	☾	♊	♊	5 23	6 36	8 36	5 33	6 28	8 54			
30	M.	☾	♊	♊	5 24	6 35	9 06	5 34	6 26	9 28			
31	Tu.	☾	♊	♊	5 25	6 34	9 43	5 35	6 25	10 08			

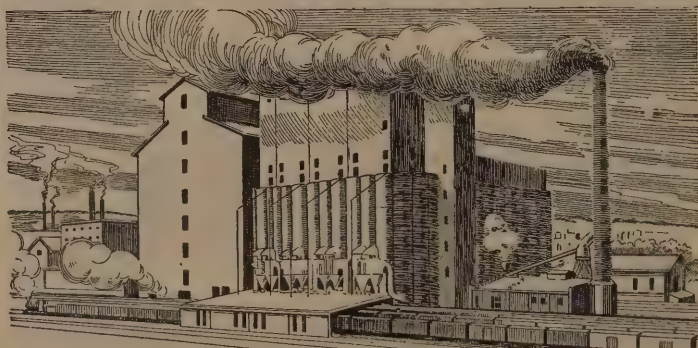


Modern shipping

SEPTEMBER

Moon's Phases	D.	Intercol. T.		Eastern T.		Central T.		Mountain T.		Pacific T.	
		H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
☾ Last Quarter	1	9	10	57	9	57	8	57	7	57	6
● New Moon	9	10	53	5	53	4	53	3	53	2	53
☽ First Quarter	16	3	21	2	21	1	21	0	21	11	21*
☾ Full Moon	23	5	35	4	35	3	35	2	35	1	35

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place		UNITED STATES									
			Sign	Con.	Northern States					Southern States				
					Sun Rises		Sun Sets		Moon R. & S.	Sun Rises		Sun Sets		Moon R. & S.
					H.	M.	H.	M.	H. M.	H.	M.	H.	M.	H. M.
1	Wed.	☾	♊	♊	5	26	6	33	10 27	5	35	6	24	10 55
2	Th.	☾	♊	♊	5	27	6	31	11 15	5	36	6	23	11 44
3	Fr.	☾	♊	♊	5	28	6	29	morn	5	37	6	21	morn
4	Sat.	☾	♊	♊	5	29	6	28	14	5	37	6	20	40
5	Sun.	☾	♊	♊	5	30	6	26	1 16	5	38	6	19	1 39
6	M.	☾	♊	♊	5	31	6	25	2 20	5	39	6	17	2 39
7	Tu.	☾	♊	♊	5	32	6	23	3 27	5	39	6	16	3 41
8	Wed.	☾	♊	♊	5	33	6	21	4 35	5	40	6	15	4 43
9	Th.	☾	♊	♊	5	34	6	20	sets	5	41	6	13	sets
10	Fr.	☾	♊	♊	5	35	6	18	6 45	5	42	6	12	6 50
11	Sat.	☾	♊	♊	5	36	6	16	7 09	5	42	6	11	7 21
12	Sun.	☾	♊	♊	5	37	6	15	7 39	5	43	6	09	7 56
13	M.	☾	♊	♊	5	38	6	13	8 14	5	43	6	08	8 36
14	Tu.	☾	♊	♊	5	39	6	11	8 57	5	44	6	06	9 23
*15	Wed.	☾	♊	♊	5	40	6	09	9 53	5	45	6	05	10 22
16	Th.	☾	♊	♊	5	41	6	08	10 59	5	46	6	04	11 26
17	Fr.	☾	♊	♊	5	42	6	06	morn	5	46	6	03	morn
18	Sat.	☾	♊	♊	5	43	6	04	12	5	47	6	01	36
19	Sun.	☾	♊	♊	5	44	6	03	1 26	5	48	6	00	1 45
20	M.	☾	♊	♊	5	45	6	01	2 39	5	49	5	58	2 53
21	Tu.	☾	♊	♊	5	46	5	59	3 50	5	49	5	57	3 59
22	Wed.	☾	♊	♊	5	47	5	58	4 59	5	50	5	56	5 01
23	Th.	☾	♊	♊	5	48	5	56	rises	5	50	5	54	rises
24	Fr.	☾	♊	♊	5	49	5	54	6 12	5	51	5	53	6 23
25	Sat.	☾	♊	♊	5	50	5	53	6 37	5	51	5	52	6 52
26	Sun.	☾	♊	♊	5	51	5	52	7 06	5	52	5	50	7 27
27	M.	☾	♊	♊	5	52	5	50	7 41	5	52	5	49	8 05
28	Tu.	☾	♊	♊	5	53	5	48	8 20	5	53	5	48	8 48
29	Wed.	☾	♊	♊	5	54	5	46	9 09	5	54	5	46	9 37
30	Th.	☾	♊	♊	5	54	5	44	10 02	5	55	5	46	10 29



Modern methods of storing grain

OCTOBER

Moon's Phases	D.	Intercol. T.		Eastern T.		Central T.		Mountain T.		Pacific T.	
		H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
☾ Last Quarter	1	5	44	4	44	3	44	2	44	1	44
● New Moon	8	5	42	4	42	3	42	2	42	1	42
☾ First Quarter	15	9	51	8	51	7	51	6	51	5	51
☾ Full Moon	22	8	15	7	15	6	15	5	15	4	15
☾ Last Quarter	30	0	40	11	40	10	40	9	40	8	40

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign	Moon's Place Con.	UNITED STATES											
					Northern States						Southern States					
					Sun Rises		Sun Sets		Moon R. & S.		Sun Rises		Sun Sets		Moon R. & S.	
					H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	Fr.	☾	☾	☾	5 56	5 43	11 01	5 55	5 45	11 26						
2	Sat.	☾	☾	☾	5 57	5 41	morn	5 56	5 43	morn						
3	Sun.	☾	☾	☾	5 58	5 39	04	5 56	5 41	25						
4	M.	☾	☾	☾	5 59	5 38	1 09	5 57	5 40	1 25						
5	Tu.	☾	☾	☾	6 00	5 36	2 16	5 58	5 39	2 27						
6	Wed.	☾	☾	☾	6 01	5 35	3 23	5 58	5 37	3 28						
7	Th.	☾	☾	☾	6 02	5 33	4 33	5 59	5 36	4 33						
8	Fr.	☾	☾	☾	6 03	5 31	5 44	6 00	5 35	5 38						
9	Sat.	☾	☾	☾	6 04	5 30	sets	6 01	5 33	sets						
10	Sun.	☾	☾	☾	6 05	5 28	6 12	6 01	5 32	6 32						
11	M.	☾	☾	☾	6 07	5 27	6 55	6 02	5 31	7 20						
12	Tu.	☾	☾	☾	6 08	5 25	7 47	6 03	5 30	8 15						
13	Wed.	☾	☾	☾	6 09	5 23	8 51	6 04	5 29	9 19						
14	Th.	☾	☾	☾	6 10	5 22	10 03	6 04	5 27	10 28						
15	Fr.	☾	☾	☾	6 11	5 20	11 17	6 05	5 26	11 38						
16	Sat.	☾	☾	☾	6 12	5 19	morn	6 06	5 25	morn						
17	Sun.	☾	☾	☾	6 13	5 17	30	6 07	5 24	45						
18	M.	☾	☾	☾	6 14	5 16	1 40	6 07	5 23	1 50						
19	Tu.	☾	☾	☾	6 15	5 14	2 48	6 08	5 22	2 53						
20	Wed.	☾	☾	☾	6 16	5 13	3 53	6 09	5 20	3 52						
21	Th.	☾	☾	☾	6 18	5 12	4 58	6 10	5 19	4 52						
22	Fr.	☾	☾	☾	6 19	5 10	6 03	6 11	5 18	5 51						
23	Sat.	☾	☾	☾	6 20	5 09	rises	6 11	5 17	rises						
24	Sun.	☾	☾	☾	6 21	5 07	5 41	6 12	5 16	6 03						
25	M.	☾	☾	☾	6 22	5 06	6 18	6 13	5 15	6 43						
26	Tu.	☾	☾	☾	6 23	5 04	7 02	6 14	5 14	7 30						
27	Wed.	☾	☾	☾	6 24	5 03	7 53	6 15	5 13	8 21						
28	Th.	☾	☾	☾	6 26	5 02	8 50	6 16	5 12	9 15						
29	Fr.	☾	☾	☾	6 27	5 01	9 50	6 16	5 11	10 13						
30	Sat.	☾	☾	☾	6 28	4 59	10 54	6 17	5 10	11 12						
*31	Sun.	☾	☾	☾	6 29	4 58	11 58	6 18	5 10	morn						



Modern light delivery service

NOVEMBER

Moon's Phases	Intercol. T.	Eastern T.	Central T.	Mountain T.	Pacific T.
● New Moon	D. 7	H. 3 M. 52	H. 2 M. 52	H. 1 M. 52	H. 0 M. 52
☾ First Quarter	13	7 3	6 3	5 3	4 3
☾ Full Moon	21	1 36	0 35	11 36	10 36
☾ Last Quarter	29	6 10	5 10	4 10	3 10

Day of Mo.	Day of Week	Light and Dark of Moon	UNITED STATES								
			Moon's Place						Northern States		
			Sign	Con.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises	Sun Sets	Moon R. & S.	Sun Rises
1	M.	☾	♏	♏	6 30	4 57	morn	6 19	5 09		11
2	Tu.	☾	♏	♏	6 31	4 56	1 03	6 20	5 08	1 11	
3	Wed.	☾	♏	♏	6 32	4 54	2 11	6 21	5 07	2 13	
4	Th.	☾	♏	♏	6 34	4 53	3 19	6 22	5 06	3 16	
5	Fr.	☾	♏	♏	6 35	4 52	4 32	6 23	5 05	4 23	
* 6	Sat.	☾	♏	♏	6 36	4 51	5 48	6 23	5 04	5 33	
7	Sun.	☾	♏	♏	6 37	4 50	7 09	6 24	5 04	6 49	
8	M.	☾	♏	♏	6 38	4 49	sets	6 25	5 03	sets	
9	Tu.	☾	♏	♏	6 40	4 48	6 37	6 26	5 02	7 05	
10	Wed.	☾	♏	♏	6 41	4 47	7 49	6 27	5 02	8 14	
11	Th.	☾	♏	♏	6 42	4 46	9 05	6 28	5 01	9 26	
12	Fr.	☾	♏	♏	6 43	4 45	10 22	6 29	5 00	10 38	
13	Sat.	☾	♏	♏	6 44	4 44	11 33	6 30	5 00	11 45	
14	Sun.	☾	♏	♏	6 46	4 43	morn	6 31	4 59	morn	
15	M.	☾	♏	♏	6 47	4 42	41	6 31	4 58	51	
16	Tu.	☾	♏	♏	6 48	4 41	1 46	6 32	4 58	1 47	
17	Wed.	☾	♏	♏	6 49	4 40	2 50	6 33	4 57	2 45	
18	Th.	☾	♏	♏	6 50	4 39	3 53	6 34	4 57	3 44	
19	Fr.	☾	♏	♏	6 51	4 38	4 54	6 35	4 57	4 41	
20	Sat.	☾	♏	♏	6 53	4 38	5 59	6 36	4 56	5 40	
21	Sun.	☾	♏	♏	6 54	4 37	rises	6 37	4 56	rises	
22	M.	☾	♏	♏	6 55	4 36	4 59	6 38	4 55	5 26	
23	Tu.	☾	♏	♏	6 56	4 36	5 50	6 39	4 55	6 16	
24	Wed.	☾	♏	♏	6 57	4 35	6 43	6 40	4 55	7 09	
25	Th.	☾	♏	♏	6 58	4 35	7 43	6 41	4 55	8 06	
26	Fr.	☾	♏	♏	6 59	4 35	8 44	6 41	4 54	9 03	
27	Sat.	☾	♏	♏	7 00	4 34	9 46	6 42	4 54	10 01	
28	Sun.	☾	♏	♏	7 02	3 34	11 03	6 43	4 54	11 09	
29	M.	☾	♏	♏	7 03	4 34	11 54	6 44	4 54	11 59	
30	Tu.	☾	♏	♏	7 04	4 34	morn	6 45	4 54	morn	



Modern grain delivery to market

DECEMBER

Moon's Phases	D.	Intercol. T.	Eastern T.	Central T.	Mountain T.	Pacific T.
● New Moon	6	H. M. 4	H. M. 1 4	H. M. 0 4	H. M. 11 4	H. M. 10 4
☾ First Quarter	13	7 38	6 38	5 38	4 38	3 38
☾ Full Moon	21	8 52	7 52	6 52	5 52	4 52
☾ Last Quarter	29	8 59	7 59	6 59	5 59	4 59

Day of Mo.	Day of Week	Light and Dark of Moon	Moon's Place Sign	Moon's Con.	UNITED STATES					
					Northern States			Southern States		
					Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.	Sun Rises H. M.	Sun Sets H. M.	Moon R. & S. H. M.
1	Wed.	☾	♊	♊	7 05	4 34	5 59	6 46	4 54	5 58
2	Th.	☾	♊	♊	7 06	4 33	2 07	6 47	4 54	2 01
3	Fr.	☾	♊	♊	7 07	4 33	3 20	6 47	4 54	3 09
4	Sat.	☾	♊	♊	7 08	4 33	4 38	6 48	4 54	4 20
5	Sun.	☾	♊	♊	7 09	4 32	5 57	6 49	4 54	5 35
6	M.	☾	♊	♊	7 10	4 32	7 17	6 50	4 54	6 51
7	Tu.	☾	♊	♊	7 11	4 32	sets	6 51	4 54	sets
8	Wed.	☾	♊	♊	7 12	4 32	6 41	6 51	4 54	7 05
9	Th.	☾	♊	♊	7 13	4 32	8 02	6 52	4 54	8 20
10	Fr.	☾	♊	♊	7 14	4 32	9 18	6 53	4 55	9 31
11	Sat.	☾	♊	♊	7 15	4 32	10 29	6 53	4 55	10 37
12	Sun.	☾	♊	♊	7 15	4 32	11 38	6 54	4 55	11 40
13	M.	☾	♊	♊	7 16	4 33	morn	6 55	4 56	morn
14	Tu.	☾	♊	♊	7 16	4 33	43	6 55	4 56	40
15	Wed.	☾	♊	♊	7 17	4 33	1 47	6 56	4 56	1 38
16	Th.	☾	♊	♊	7 18	4 33	2 50	6 57	4 57	2 37
17	Fr.	☾	♊	♊	7 18	4 33	3 53	6 57	4 57	3 36
18	Sat.	☾	♊	♊	7 19	4 34	4 54	6 58	4 57	4 32
19	Sun.	☾	♊	♊	7 20	4 34	5 54	6 58	4 58	5 28
20	M.	☾	♊	♊	7 20	4 35	6 50	6 59	4 58	6 23
21	Tu.	☾	♊	♊	7 21	4 35	rises	6 59	4 59	rises
22	Wed.	☾	♊	♊	7 21	4 36	5 36	7 00	4 59	6 00
23	Th.	☾	♊	♊	7 22	4 37	6 35	7 00	5 00	6 56
24	Fr.	☾	♊	♊	7 22	4 37	7 39	7 01	5 00	7 55
25	Sat.	☾	♊	♊	7 23	4 38	8 40	7 01	5 01	8 52
26	Sun.	☾	♊	♊	7 23	4 39	9 44	7 01	5 01	9 50
27	M.	☾	♊	♊	7 23	4 39	10 47	7 02	5 02	10 48
28	Tu.	☾	♊	♊	7 23	4 40	11 51	7 02	5 03	11 47
29	Wed.	☾	♊	♊	7 24	4 40	morn	7 03	5 03	morn
30	Th.	☾	♊	♊	7 24	4 41	1 00	7 03	5 04	51
31	Fr.	☾	♊	♊	7 24	4 42	2 14	7 03	5 05	1 59



Transportation via Panama Canal

*More people are thinking of agriculture
these days than all other lines of endeavor*

Wintering Bees

By Frank C. Pellett, State Inspector of Apiaries, Atlantic, Iowa.



Hives covered with tar paper for out-door wintering

The essentials of successful wintering are: First, plenty of stores of good quality; second, a vigorous young queen; and third, suitable protection.

Normally, the bee voids its excrement only while on the wing. The long confinement of winter is a severe tax at best, and unless the honey is of good quality, the abdomen becomes badly distended, and, in time, death results. The whiter the honey, the less waste it contains, and the better feed it makes for

winter stores. Many bee keepers make a practice of removing the dark fall honey from the hive, and replacing it with full combs of clover honey, or feeding a sufficient quantity of thick sugar syrup, to carry the bees through until spring. A liberal quantity of honey or syrup should always be present in the hive, as brood rearing is carried on much more freely in early spring where the bees have plenty of stores, and it is the strong colonies that gather the big crops of honey.

A large part of the winter losses can be traced to old queens, which fail in winter, at a time when the bees are unable to replace them in the natural manner. Should they rear a young queen from the brood present in the hive, she would have no opportunity for mating, and so, of course, would be useless. It is a common practice among successful bee keepers, to re-queen all their colonies every year, and thus insure young queens. Others re-queen every two years, saying that a large portion of the queens are as good the second year as the first.

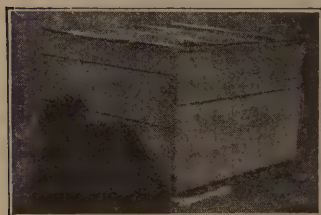
It is very important that bees wintered out of doors be protected from the cold winds.

Bees will endure a very low temperature, if kept dry and free from drafts. A suitable wind break is of great value, and the hives should be packed in leaves or other suitable material. The packing should be kept dry, as a wet or frozen pack is as bad or worse than none at all. This protection is about as essential during the changeable weather of early spring as in winter. As soon as warm days come, the bees begin brood rearing with the result that a sudden change often makes it impossible for them to keep up the temperature of the hive, and a part of the brood is chilled and consequently lost.

By looking after the three essentials above noted, one can winter bees out of doors as far north as Ottawa, Canada. In fact, those wintered outside come through in even better condition than those wintered in cellars. Not one of the three must be overlooked, or disastrous results are likely to accrue. In seasons when the honey-flow has been light and an insufficient quantity of stores for wintering is present in the hive it will be necessary to feed. A thick syrup should be made by using equal parts of granulated sugar and water. The thicker the syrup the less tax on the bees.



Packing box for out-door wintering with hives in place. The hives are then covered with dry leaves



Two colonies packed together
Entrances open to permit flight

*Install labor-saving machines for the house-
wife that her days may be long in the land*

Modern Conveniences in the Farm Home

By Courtesy of Mrs. Frank H. McKelvey (U. of Ill., 1909), Sparta, Illinois

Everyone realizes that the woman of today should be interested in better government, better schools, and better neighborhoods. We see the need of time to give to personal care and attractiveness, to mental development and a growing family. We know that a tired mother does not add comfort to a family circle, when she is supposed to be a companion, a guide, and an inspiration. For these reasons she should have working tools so that all labor may be reduced to a minimum, leaving her time for personal, social, and educational diversions.

The farm women of America constitute the largest class of economically useful women, and yet other classes of women have been borne out beyond them by the modern aids in their work. Conveniences and labor saving devices have entered the farm homes slowly because the farm women have been so much at home that they fail to see the advancements that were being made around them.

Running water in the house is no doubt the greatest help to any housekeeper. It may be just a cistern with a pump plying into a kitchen sink, or a system whereby the water is forced by power, such as electricity, gasoline, or windmill, into a tank, making it possible to have water closet, bath tub, and lavatories with hot and cold water upstairs and down.

No one needs the convenience of a bath room more than the farmer, for, after a hard day's work in the dust and heat, a bath restores self respect and gives rest, to say nothing of the temper and hard washing saved.

A water supply for the house cannot be separated from a sewage system, yet a sewage system could be had without a water supply. This would save the housekeeper from carrying out the water which she carries into the house. Such a system could be installed at small expense for labor and materials. The plumbing of the house should join a six-inch vitrified tile laid in cement. The waste then passes into this tile and empties into a septic tank or catch basin. The overflow from the septic tank passes out through more vitrified tile, then porous tile, and finally empties into a field away from the house. The tiles should dip down as they enter and leave the septic tank so that the inlet and outlet are closed, preventing the escape of gases and keeping the scum from filling the tile.

It is no longer the custom to build a house of any size in town without installing a heating plant, yet most farmers fail to consider such a thing. There are three systems used, hot water, steam, and hot air. The hot water heats slowly, but keeps the house warm for a longer period than either steam or hot air. Steam heats quickly, but as the fire gets low the temperature falls rapidly. The hot air is often influenced by the wind. The hot water system is the most expensive of the three, and the hot air is the cheapest. The cost of heating a house depends entirely upon its size, glass area and exposure. Such plants use less coal than would be burned by stoves in heating the same space, are cleaner and give a more uniform heat.

The kerosene lamp, which was a great step in the progress of civilization, is being replaced slowly in country homes by gas and electric lighting systems.

Years ago the farmers were driven to buying machinery because of the scarcity and high price of farm labor. The low price for their grain, too, made it necessary for them to raise as much as possible and at the least expense. Almost every trade has made great steps in increasing efficiency and reducing fatigue except housekeeping. Why shouldn't women apply to their housework such principles as are used by the contractor, manager, or their own husbands?

One of the great white elephants in the home is the weekly washing and ironing. It consumes two whole days, usually, exhausting and putting every-

*Don't let the wife be the motor
power for the washer and wringer*

body out of humor and the rest of the housework goes to wreck and ruin in the meantime. Consequently another day is required to get over the effects of the two previous ones. Laundry work enters also into the servant problem for there are many girls who refuse to work where they are expected to do the family washing. The clothes may be sent from home but it is an expense and many times unsatisfactory. There is a solution to this problem and women who are not strong can be independent. It is by the use of the power washer. The same power that pumps the water can be used, or a small gasoline engine. There is an outfit on the market that appeals to me very much, in fact it is to be installed in my own home. A small gasoline engine runs the washing machine, mangle and wringer. The wringer turns to place over any of the tubs. Cypress wood is used throughout and all of the castings are smooth and simple. Another great laundry help is the mangle for ironing flat pieces. There are two kinds, the cold and the heated. The cold mangle is constructed like a wringer, and simply presses out the wrinkles without giving a gloss. The heated mangles may be operated either by hand or power and are heated by gas or gasoline. A heated steel cylinder is the iron, while the one or two added rollers takes the place of the ironing board. Pieces pass through this machine at the rate of seven feet per minute and have a gloss that it is not possible to gain by hand. The ironing may be done in one-third the time required by the old way, looks better, and all the labor needed is to guide and fold the pieces. An ironing board is necessary for the pieces that are not flat.

The refrigerator is still an innovation on a large majority of farms. My own holds two hundred pounds of ice, is located in a small closet or room by itself and is connected with a drain. The ice is put in from the outside through a small door in the wall. In winter the inside doors of the ice box are left open, a small window above the box opened and I have a cold pantry. Our meat is wrapped after curing and hung above the ice box from hooks in the ceiling of this same room.

Women who have a great deal of bread to bake, will find the bread mixer a great help. All of the ingredients are measured and placed in the mixer, then the handle is turned from three to five minutes. The mixer is covered and the bread allowed to rise. When light the handle is turned to mix and knead it. One need never touch the hand to the bread till ready to make out into loaves.

It has been said that the wasted energy in the average home, if properly utilized, would be sufficient to build houses for all the poor, and plant and harvest the crops for all the hungry. If you are interested in saving energy in your home, the wheeled-tray will be found an important factor.

Has an egg-beater supplanted a spoon or fork in your kitchen? Do you still use a chopping bowl, or sausage grinder in place of a food grinder that will crush bread, grind meat, make nut butter and chop vegetables? Have you a fireless cooker? They save time and fuel and during the summer help to keep the kitchen much cooler. Do you use dust cloths that hold the dust? They can be bought but may be made more easily and more cheaply. Take squares of cheese-cloth or soft flour sacks and sprinkle with paraffin oil, not too freely, and roll up until evenly distributed over the cloths.

Now the last but by no means the least is a high stool. Get it, sit on it to iron, to wash dishes and when paring vegetables at the sink. You will find it very convenient too for reaching the high pantry shelves.

Get for yourself some if not all of the things that make your work lighter, and more interesting. Do not let the prevalent idea, that economy and saving are the same, get hold of you. Every strain if it comes as a result of trying to save, has cost more than it saved. "It is wise economy, whatever it cost, which saves one's nature whole and sweet, one's brain clear and keen, one's body responsive to one's will and one's entire being in perfect tune with the Infinite."

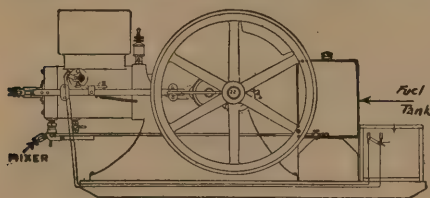
*Remember there is modern equipment
for the house as well as for the field*

Safety First

No matter how well an engine is constructed or how much care is taken in the installation, unless the fuel is properly fed to the engine it is both wasteful and dangerous. There are three general methods of supplying fuel in common use for farm and stationary engines.

Gravity feed is used on many engines because it saves the cost of a pump and permits the use of a simple and inexpensive mixer. The fuel tank is elevated above the level of the mixer, so that the fuel will flow by gravity to the mixer. A stop cock or check valve is usually placed in the supply pipe, ostensibly to prevent the fuel from flowing when the engine is not running. However, if the engine stops or the operator forgets to shut off

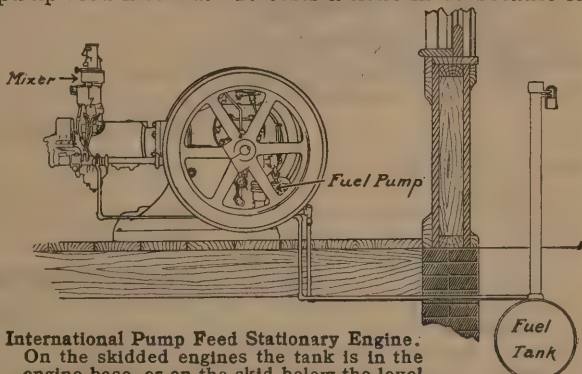
the stop cock, the fuel continues to run, and even in the engines equipped with a check valve the fuel will often slowly drip out. The waste of fuel is a small matter compared to the danger in operating such an engine in any kind of building; insurance regulations positively forbid the installation of gravity feed engines in insured buildings.



A Typical Gravity Feed Engine

Another method, successful on small engines but impractical on large engines, is the suction feed method. The tank is placed under the mixer and the fuel is sucked up for each charge by the cylinder. It is safe as there can be no escape of fuel.

The real safe method, and the one that is used on all International engines from 2-H.P. up is the pump feed method. It costs a little more because it requires a special double compartment mixer, extra piping, and a fuel pump. It is the only method that can be used in an enclosed building with the tank set **outside** and **below** the engine level and the only one recognized as safe by the insurance companies.



International Pump Feed Stationary Engine.

On the skidded engines the tank is in the engine base, or on the skid below the level of the mixer

The same regard for the users' safety and economy is carried in every part of International engines. The design incorporates features and the construction requires extra operations that protect the user against delays, waste of power, and unsatisfactory service.

International Harvester engines are made in all styles—vertical, horizontal, stationary and portable; air and water-cooled—and range in size from 1 to 50-H.P. They operate on low and high grade fuels. International oil tractors range in size from 6-12 to 30-60 H.P.

KEEP YOUR I H C ALMANACS

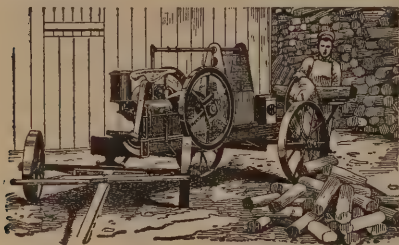
The information contained in the 1915 I H C Almanac differs from the information contained in previous issues. We suggest that previous issues be retained for reference.

Conservation of Energy

'Save your energy for the big, important jobs,' is a good axiom to work on nowadays when the profit of the farm depends so much on maximum production, and that in turn depends on the quality of the field work. This does not mean do less work, but with the aid of the modern oil engine the same or more work can be accomplished at a great saving of time and labor.

Many farmers may think that they have not enough work for an engine to pay for owning it. But it is surprising how many things can be done with an engine, and once one has become familiar with power work and realizes how easily hard jobs are accomplished, he sees many more uses for his engine than when he purchased it.

Common Uses. The following includes the more common machines that can be easily and profitably run by oil engine power. While it is not always possible to operate all the machines mentioned with the same engine, it is possible to group many of them and have a central power house. In this case the water, laundry, and dairy machines can be operated by electricity from a generator in the power house. For simpler installation either the engine is mounted on a hand truck or a large and small engine are used.



Water Supply. One of the most important parts of the farm equipment and one of the easiest if run by engine power, is the water supply system. The simplest method is to have a central storage tank to pump into, but the system can be made as elaborate as desired, and all the sanitary and convenient arrangements of a city system can be obtained.

The Dairy. Cream separator. Babcock milk tester. Power churn. Power butter worker, for large dairies. Power ice cream freezer. Pump, when a central water system is not used.

The Granary. A bucket elevator, discharging into and receiving from all bins, and arranged to mix for grinding, etc. Spiral conveyors, where grain must be carried far, horizontally. Fanning and separating machinery. Feed grinder. Corn sheller.

Work Shop. Forge blower. Power drill. Emery wheel. Grindstone. Rip and cut-off saw. Other wood-working machinery, as may be desired.

Outdoor Uses. Wood-saw. Wood splitter. Ensilage cutter and blower. Small thresher and corn shredder. Fertilizer mixer.

Barn. Horse clipper. Horse and cattle currier. Root slicer. Feed cutter. Pump where a central water system is not used. Hay hoist.

Lighting. Dynamo and storage battery. Light fixtures. Perhaps light cooking, if sufficient voltage can be secured.

Laundry. Power washer. Power wringer. Centrifugal dryer, if needed. Mangle.

House. Vacuum cleaner. Dish washer. Electric fans. Pump where water system is not used.



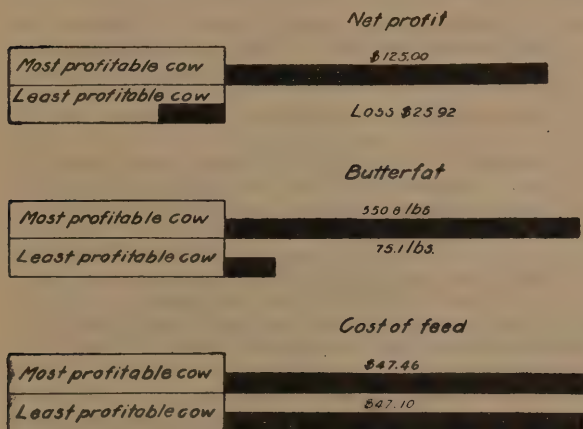
The Necessity of Keeping Records of Dairy Cows

By Prof. H. H. Kildee, Dept. of Animal Husbandry, Iowa State College

It is a conservative statement to say that practically one-third of the cows now milked in the United States are kept at a loss. When one considers the high cost of feed and labor he realizes that it is not good business policy to care for, feed and milk a cow for eight or ten months and then find that she is being paid for the privilege of her company. We know that there is a certain correlation between the conformation of a cow and her productive ability so far as quality of milk is concerned but this can not be measured definitely by external characteristics and there is no external characteristic which indicates the richness of the milk or the per cent of butter fat contained. The only accurate method of determining the relative merits of the cows in a herd is to make use of the milk scale, the Babcock fat test and the feed record throughout the lactation period.

The care, feed and management of a dairy cow has much to do with her production; however, there is great variation between individuals kept under the same conditions. Last year the best cow in our herd produced 20,816.2 pounds of milk, 732.94 pounds of butter fat and returned a net profit of \$160.36 from sale of butter fat at creamery price, while the poorest cow kept in the same barn and fed the same feeds, although in smaller amounts, because of less capacity, produced but 2,931.2 pounds of milk, 123.1 pounds of butter fat and a profit of but \$4.96.

As evidence of the great variation which exists in the cows kept under farm conditions, I wish to call the reader's attention to graphic illustrations taken from Extension Bulletin No. 13 of the Iowa State College. This bulletin gives the report of the co-operative cow testing associations in Iowa for years 1910-12 inclusive.



The chart indicates that the difference in net profits for one year between the most profitable and least profitable of the 2,950 cows was \$150.92; in butter fat produced the difference was 475 pounds and in cost of feed but 36 cents.

How One Iowa Herd Improved

The following records made by the herd of Peder Pedersen & Son in the Benson Cow Testing association in three consecutive years is especially interesting and valuable in this connection, as it shows what can be accomplished on the farm by keeping records, weeding out the poor cows and by proper feeding and management.

*Nature does her best for you, but help in the
way of modern machines works wonders*

	Average milk per cow	Average butter fat per cow	Net income per cow over cost of feed
1911	5665 pounds.....	207.7	\$ 22.12
	Largest net income cow in herd.....		54.22
1912	7060 pounds.....	251.9	53.96
	Largest net income cow in herd.....		106.30
1913	9697.47 pounds.....	341.98	75.00
	Two largest net income cows each.....		144.00

The increase in production and in the net returns for butter fat, after deducting the cost of feed, in this herd in the course of three years is remarkable and was brought about by use of a pure bred sire, weeding out the inferior cows and giving the remaining ones better care and feed. This herd was made up of grades and a few pure bred Holsteins and the number of cows remained about the same during the three years reported.

At the end of the first year it was found that 40 per cent of the cows were unprofitable. They were sent to the butcher and their places in the herd taken by two year old heifers sired by a pure bred sire and out of common cows. The records at the end of the second year showed over 24 per cent increase in the quantity of milk and 26 per cent increase in amount of butter fat per cow. At the end of the second year 30 per cent of the cows were "weeded out" and their places taken by two year old grade heifers and one pure bred cow and one pure bred two year old heifer. The end of the third year's work showed that the average milk production had been increased over 71 per cent, the butter fat 60 per cent and the average net profit per cow increased from \$22.12 to \$75.00 or 239 per cent.

The question of how to keep records of each individual cow without going to a great deal of expense is one which confronts the progressive dairy farmer. The best answer is, establish a co-operative cow testing association.

Co-operative Cow Testing Associations

The first one was organized in 1895 in Denmark where there are now over 500 associations. The Danish plan of organization has spread over the dairy sections of Europe and there are now over 125 associations in the United States.

The benefits of one of these organizations are many and there is nothing that will do more to develop a dairy community.

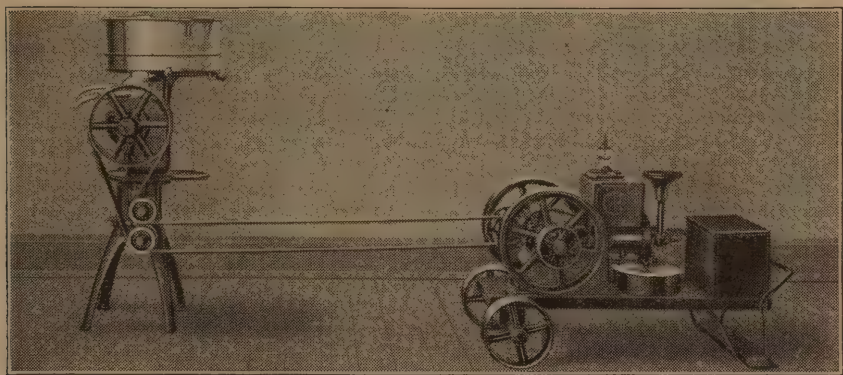
When one lives in a community where there are too few farmers interested to start an association in a state where they are not being promoted as yet, it is still comparatively easy and inexpensive to keep records of the milk and butter fat production of each cow.

Record sheets may be secured for little cost from publishers of dairy papers. Milk scales are not expensive and it takes but one to one and a half minutes per day to weigh and record the milk from each cow. A Babcock tester may be purchased at a nominal cost or the composite samples taken at each milking for a one or two days' period each month may be taken to the creamery for the fat determination.

A few of the many benefits may be mentioned as follows:

1. It puts the work on a business basis and arouses the farmer's interest in his cows and results in better care, feed and management.
2. It gives a basis for improvement as illustrated in the case of the Pedersen herd. By replacing the inferior animals with heifers, by a good pure bred sire and by employing better methods of feeding and management, the average production of the herd may soon be brought up to 350 pounds of butter fat per cow and the profit per cow very materially increased.
3. It increases the selling price of all animals in the herd and all animals related to them.

Abuse, not use, results in unsatisfactory service of a farm machine



A profitable I H C outfit

A Drop of Cream to a Gallon of Milk

A farmer who owned a particularly good threshing outfit used to claim that he could thresh a thousand bushels of wheat with a loss of only nine bushels. Later he proved that he could do it, and the manufacturer of that threshing machine advertised the fact far and wide as a wonderful example of efficiency.

That same farmer was solicited to buy an International Harvester cream separator, the salesman using the argument that hand skimming of cream was causing a waste much greater than the nine-bushel waste in threshing his thousand bushels of wheat. While testing the separator to prove to the farmer how much butter fat from his ten cows he was losing every year—enough to make 250 pounds of butter—the salesman brought out the fact that the separator left but little more than a drop of cream in each gallon of skimmed milk. Comparing this to the farmer's threshing record, the salesman showed that the farmer would have to thresh his wheat so cleanly as to waste less than a peck in a thousand bushels in order to equal the record of the cream separator used in this test.

Buy and begin at once to use an International Harvester cream separator—Dairymaid, Bluebell, Lily or Primrose—the machines that skim so closely that only a drop of cream is left to every gallon of skimmed milk. You will find that the extra cream is but one of the smallest of the savings the machine makes for you.

Here are a few of the things you gain when you buy an I H C cream separator: The most carefully built separator on the market. A separator with the fewest and easiest adjustments. A self oiling separator. A separator that gives you the least possible trouble and for which repairs are always handy. A separator that anyone on the farm can run and manage successfully.

Again, an I H C cream separator saves the everlasting work of hand skimming and pan washing and also the use of a wagon and team to haul milk to the creamery. The skim milk coming fresh and warm from the separator makes the best possible feed for pigs and calves. By skimming all the cream, it saves from \$5.00 to \$15.00 per cow per year. It stimulates the dairy business, leads you to increase your herd, indirectly conserves the fertility of your farm, and insures the largest possible cash income.

These separators are all made in four sizes, to skim 350, 450, 650 and 850 pounds of milk per hour. The number of gallons each size will skim may be found by dividing the number of pounds by 8.6.

The Cream Separator as a Basis for Farm Activities

The invention of the cream separator has been epoch making. The need of such a machine was greater than at first appeared. We can imagine that the idea of the inventor was to reduce the labor of handling milk and to prevent the waste of butter fat. But underlying these was the greatest need, that of bringing new life to the agricultural interests of the country.

Why the cream separator? Because it means economy in farm activities and soil conservation. One can scarcely pick up a farm paper or a magazine without reading of the many abandoned farms throughout our country. Happily, the tide is turning and these farms are being taken up and made to return good profits to the owners as well as providing beautiful, healthful homes. And how? By cream separators and dairy cows.

The wealth of the state of Wisconsin is famous throughout the world. The cream separator and the dairy industry are responsible for the worldwide renown of this wonderful state.

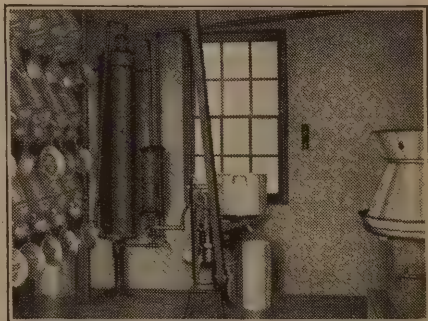
In the south, great plantations, after making several generations happy and prosperous, have failed in recent years to produce in large quantities. The soil has been exhausted by years of continuous cotton crops. Yet these plantations are again being heard from. The hum of the cream separator is heard in the southland and to this tune the farmers are marching to prosperity.

The cream separator makes possible the profitable handling of the dairy cow and is therefore directly responsible for the solution of the farmer's credit and interest problems. It has solved them by eliminating them. Butter fat sells at a good price the year round. It is taken to market three or four times a week and a check for payment in full is received by the farmer at the end of every week, or at the most, the end of every month. The dairy business is a cash business. The farmer can buy for cash and secure the best cash prices and the cost of living for him goes down very materially.

The cream separator and the dairy cow have solved the farmer's problem of getting his produce to market. The cow takes the crops and converts them into her own product, which is the most valuable product in convenient, marketable shape and eliminates waste. Marketing costs are reduced and profits thereby increased.

The farm that is operated with the cream separator as the basis of its activity loses little or no fertility from the soil. The milk is separated on the farm and the skimmed milk fed to the young stock. Eighty per cent of the food consumed by the cows is returned to the soil in the form of manure. The loss of twenty per cent of all the food consumed is somewhat counterbalanced by the rotation of crops, good drainage, addition of ground limestone, and good, deep tillage in preparing the seed bed.

The cream separator is not only producing profits for the farmer from the dairy herd, but also from the fact that the farm is daily increasing in value. Finally, it means better and more prosperous farms and a farm home to be kept up, added to and passed on from father to son.



A well equipped milk house increases the value of the farm and proves a profitable investment

An ounce of oil is better than a pound of repairs

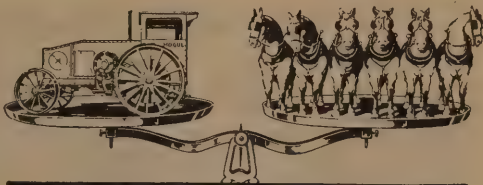
Plow Deep While Sluggards Sleep

—Poor Richard

Benjamin Franklin never professed to know anything about carpentry, but he could hit a nail on the head. His "Plow Deep," written in 1770 to rouse ambition in his readers, needs emphasis among farmers more today than it did then.

"What is the reason," asks Parsons, "we cannot raise as many tons of beets on our rich, virgin soils as Germany does on soils that have been farmed for six hundred years or more?"

"Why is it that we consider two hundred bushels of potatoes to the acre an enormous crop, while in the British Isles, especially the Island of Jersey, they grow from six hundred to eight hundred bushels per acre?"



Weights less than six horses; does the
work of twelve



A light weight I H C one-man outfit
that speaks for itself

Why is it that so many farmers who have seen the light are moving back on to the cheap, abandoned farms of the older settled parts of this country and are raising bumper crops on them?

The answer to all these questions is—DEEP PLOWING. They get down deep, they stir, mix, and pulverize the soil. They give the air and sunshine a chance to work their magic on it. They profit by the result.

Perhaps you believe in deep plowing but haven't had the power to do it with. Here, then, is the solution of that problem—Mogul or Titan oil tractors for small or large farms. Mogul and Titan tractors are now made for use on farms smaller than 160 acres. I H C tractors range in size from 6-12 to 30-60 horse power, all operating on kerosene or cheaper fuel.

In the face of the growing scarcity of horses, the constantly growing efficiency of I H C tractors will soon make their use almost universal on all farms requiring the power of more than two or three horses. Write for complete information.



Plowing two acres an hour with an I H C Tractor

A motor truck saves time, and time is money

Advanced Wagon Making



To be most useful to its owner a wagon must be sturdy in its construction and material, and light running. Then the addition of features that give life and convenience to the wagon makes it a lasting satisfaction. The wheels, gears, and boxes on Weber and Columbus wagons are made from selected A grade material, well ironed, braced, and properly painted.

The International fifth wheel is an advance feature used exclusively on Weber and Columbus wagons. It is made from malleable iron, exceptionally strong, and with a large wearing surface. It overcomes breaking or bending of the circle iron as the strain is evenly distributed; pitching of the bolster thereby preventing breaking of the king bolt; bowing of the reach in an up and down movement; and sagging of the rear part of the front gear, which often causes a wagon to pull hard.

Other features in the International advanced wagon making are the International link end rods, extension stakes, center board, and solid collar skein box.

To best understand the value of these features, ask the local dealer who handles Weber and Columbus wagons to explain them to you.

A Paying Substitute for Expensive Road Horses

Last September we read how European army officers and cavalry regiments were losing horses by the thousand. Next we found ourselves shipping our best horses to be used for officers and cavalry. The price of horses, high at that time, mounted fast and is still going up.

Consider the International Motor Truck as a substitute for road horses. You are still taking milk to the creamery, hauling lumber, cement, fencing, household supplies, etc.; farm machines still require new parts and repairs, most of which are needed in a hurry; your trips to town, to the mill and to the creamery will come as often when road horses are scarce and high as they do now—every day brings its work for a light, easy running, quick traveling motor truck which will go anywhere your horses will be asked to go and which travels at a speed two or three times faster than horses. A serviceable, moderately priced International Motor Truck will come nearer solving your light hauling problems this year than anything else you could buy.



The Farm Horse Power Problem

By Chas. E. Snyder, Assistant Editor National Stockman and Farmer

The horse was one of the first of the two dozen or so different kinds of animals that have been domesticated by man. We have used him for more generations than most of us care to go back but even today this best friend of man in his relation to business farming presents problems that are as yet unsolved by the great majority of farmers. Some of these problems date from the early use of the horse; others, and the greater number, are outgrowths of ever-changing economic conditions and farming operations. No man can tell just what horse stock he should keep and be real dead sure he is right, nor can any man tell just how his horses should be managed under varying conditions to get the most out of them. No farm exists that carries just the right number of horses every season to do the work promptly and efficiently without waste of time. Ten work-hours six days in the week, fifty-two weeks in the year for every horse, no lost crops and all work done when it should be done are the requirements for perfect efficiency.

Some farmers choose to do their farm work with geldings, replacing worn-out workers by purchase. These men feel that geldings deteriorate more slowly than mares, which are subject to the stress of maternity and often have to do the farm work and raise a colt at the same time. Further, there is less risk with geldings, mares often being kept from work at a critical time by abortion, foaling trouble, etc., and sometimes being lost by death from the dangers attendant upon colt bearing. But most farmers indicate by their practice that they find the mares more profitable, counting the foals that they produce. Largely these men know that there are not enough good horses to fill the market demand, and that it is good business to cater to such demand, especially when the product sought will help pay its way during development. And they also feel that it is poor policy to depend upon somebody else for what they can profitably produce themselves. Thus we find generally that mares have the preference and comprise a majority of the horse stock on most farms, the geldings going to the cities, where they are preferred.

But not all is smooth sailing when brood mares comprise the major portion of the farm horse power. Too often mares heavy in foal must be employed in doing work that no brood mare in such condition should perform. Necessity and the absence of sufficient number of other horses to do the work at a critical time demand it. Particularly is this true in the spring near foaling time. The gravest danger follows pulling a mare to her limit, backing heavy loads or backing at all over rough ground, working on slippery ground or traveling far or working hard on a hot day either before foaling or too soon after foaling. Lost foals, dead mares or mares so weakened as to be long unfit for service are likely consequences. Also when mares have colts at side the spring rush of work often demands that they do too heavy work. They come in intensely hot, perhaps the rush has prevented stopping between meals to allow the colts to nurse, and too often the colts are found off feed, constipated or dysenteric—and all good horsemen know that every check in a colt's growth likely means many dollars off his market value when grown. So the man who breeds mares upon which he must depend for a lot of work has plenty of trouble on his hands unless he places the welfare of his mares and colts above his crops and it is not always possible to tell just what it is best to do in a critical time.

The cost of keeping horses is high, just how high few farmers realize. Minnesota farm records show that the cost of feed, interest on investment, depreciation, stabling, care, harnessing, insurance, etc., will run pretty close to \$100 per horse each year. Some men will doubt these figures but the use of

scales for a short time and a little figuring will show them to be pretty nearly correct. One Pennsylvania farmer who keeps thirty-two horses busy has by keeping records found that his yearly cost of upkeep for each horse is \$110. If it costs this much to maintain our horse stock surely we cannot afford to keep any more than absolutely necessary. But a short drive through almost any section of the country will reveal barn after barn with one or more idle horses in it stamping splints on their legs and eating hay—eating up the farmer's profits—for a horse must eat every day whether he works or not.

The average farm horse works about 1,000 hours a year—about three hours a day. Few men could make a living working so short a time but we seem to expect our horses to do so. However, it is well-nigh impossible to keep our horses busy all the time. Crops cannot be harvested every day nor can we plant every week. And when harvesting time comes delay is fatal so far as profits are concerned. Furthermore if we use machines of such size as will economize man labor more horses must be on hand to run them than can be used profitably the remainder of the year. Those extra horses can seldom be hired. They must be owned.

A good many men have found a way around these snags that block the way to the most profitable employment of horses. We keep on in this world step by step overcoming whatever difficulties may appear. The high cost of farming, the competition that is all the time becoming sharper, requires that useless expense be cut out wherever possible. Good business farmers are glad to make an investment in a machine that will not only by its own inherent efficiency earn fair returns but increase those returns by cutting out overhead charges. The tractor engine that burns oil is no rich farmer's plaything, no sink-hole for the machine-crazy man's dollars. It is a real practical farm machine that will not only earn its own way but save a lot of horses and horse expense. We can thank the builders who have perfected it as it is today, just as we can thank those who have manufactured and improved all our other farm machines. What will the oil tractor do in saving horse troubles and expense? It will do the heavy work so the brood mares can do their foals justice, a big item. It will save the expense of idle horses kept for an emergency. It will permit the use of larger machinery, thus saving expensive manpower. It will do heavier hauling in faster time than horses. And it will save feed and the time and trouble that go with feeding. All this is not idle theory. It is the experience of farmer users of oil power in farm tractors.

If every farmer owned an oil tractor, as he will some day just as he owns a binder now, we would still have room for more *good* horses. The general adoption of oil power is not going to drive the horse out of the country nor take the possibility for profit out of him. No one who understands agricultural conditions expects any such thing to happen. When steam power replaced the horses used to drive the old-time threshers many felt that the horse industry was going to be hurt badly. It was not. There is endless work for the horse that can do it well and always will be. We have altogether too many of the kind of horses that fill no market demand. They are the result of crossing, indiscriminate crossing—the little pacing mare to the grade drafter, the chunky mare to the crooked-legged spavined little trotter, etc.—the product a non-descript of the dunghill type that nobody wants. If the oil tractor will put this kind of horse out of business—and it will—we shall all be better off. The misfit horse never made his grower any money, anyhow. Let us breed straight and let us breed the best sound pure-bred or high-grade mares to pure-bred stallions of their kind. The offspring will always be needed and bring good prices. But at the same time we need the cheap and efficient power that oil or kerosene will furnish us to supplement our good horses. It is the only money-winning, sensible, business-like plan to follow—*more good horses, fewer bad horses, and more farm tractors.*

Sweet Clover

At One Time Despised as a Noxious Weed, Investigation Proves It to be a Valuable Crop.

By P. G. HOLDEN, Director Agricultural Extension Department,
International Harvester Company of New Jersey.



Sweet clover growing on an abandoned tile kiln, apparently without soil or moisture, Logan County, Illinois

For many years we have observed sweet clover, melilotus or bee clover, as it is often called, growing voluntarily under adverse conditions, by the roadside, in fence corners, along the ditches in irrigated sections, and on unoccupied land in nearly every state.

It has been commonly regarded as a weed and a great nuisance, but in spite of the prejudice against it and misunderstanding regarding its agricultural value, many experiments conducted within comparatively recent years to ascertain its

adaptability, feeding value and effect upon the soil have pretty definitely determined its importance as a farm crop.

Its adaptability to soil and climatic conditions is particularly a strong feature in its favor. It will endure greater extremes of temperature and grow on soils too poor for alfalfa and under conditions where other grasses failed to produce a crop before it.

It is commonly remarked by stockmen and farmers that stock will not eat it. This, no doubt, is true in many cases, as it is true of many other feeds to which stock are not accustomed. I have often seen both cattle and horses refuse to eat corn; cows most generally refuse to eat silage at first. Sweet clover affords early spring pasture and if the stock are turned into the field when the sweet clover is young, they will soon develop an appetite for it. After they have become accustomed to it I have seen cattle eat it in preference to other hay.

A Few Points We Should Observe

Before attempting to grow it, we should have a thorough understanding of its requirements and habits, so that at least an estimate of its value under given conditions may be made.

1st. It is an excellent crop to prepare the land for alfalfa in heavy, hard and poor soils.

2nd. Its roots being softer than alfalfa, sweet clover becomes inoculated more readily than alfalfa.

3rd. Sweet clover does not stool as much as alfalfa. The shoots start from the main stem and on this account the mowing machine should be set as high as possible, so as to leave plenty of small shoots to start the next crop.

4th. Sweet clover will not bloat cattle or sheep. This is one of its chief advantages over the other clovers. It is a great milk producer.

5th. Ground intended for alfalfa will be greatly benefited by previously seeding one and preferably two years to sweet clover, as it inoculates the soil for alfalfa.

6th. It is a valuable crop in rotation because its roots decay very rapidly, adding much humus to the soil and furnishing much plant food.

7th. It is customary to turn stock on the sweet clover in the early spring when it is young. There being no other green feed they will soon become accustomed to it and like it.

8th. Sweet clover is a great soil enriching crop. A great many of the experiments conducted to ascertain its beneficial effects prove that it is one of the greatest crops we have for the soil.

9th. Sweet clover is rich in feeding value. It contains more protein than red clover and equally as much as alfalfa.

10th. Sweet clover will grow on land too wet or on land too dry for alfalfa or red clover.

11th. Sweet clover grows more rapidly than alfalfa when young, produces a good crop the first year, and provides early green pasture.

12th. It will stand more alkali or more acid in the soil than alfalfa or red clover and produce a crop.

13th. It thrives where rainfall is heaviest and where rainfall is too light to produce many other crops.

14th. It needs a firm solid seed bed. The ground should not be loose. Many of its failures on cultivated land have been due to a loose mellow seed bed.

15th. It seeds freely in humid as well as in dry sections.

16th. It will grow in many of the Southern States where red clover fails.

17th. Sweet clover makes an excellent green manure.

18th. Sweet clover grows best on soil containing plenty of lime.

19th. Perhaps one of the greatest advantages of sweet clover is its ability to thrive on almost any type of soil and under almost any climatic condition.

20th. Sweet clover should not be allowed to stand too long, as it becomes woody and loses its leaves. It should be cut when 18 to 20 inches high and before it blossoms, if it is to be used for hay.

21st. It is a weed in waste places only. It never damages cultivated crops.



Wonderful growth of nodules, containing the nitrogen gathering bacteria, on upper portion of sweet clover root. Found growing in the beach sand of Lake Michigan

SWEET CLOVER INCREASES YIELD ON OATS

Ohio Bul. No. 244. Tost, Germany, Exp.

Sweet Clover Sod		Bu. Per Acre
— Not Fertilized		51
Soil Untreated		34
Straw Produced per Acre, 3381 Pounds		
Sweet Clover Sod		
— Not Fertilized		
Soil Untreated		
Straw Produced per Acre, 1748 Pounds		

This is the result of an experiment conducted near Tost, Germany, to test the effect of green manuring with sweet clover on succeeding crops of oats. The experiment was begun in May, 1889, with a seeding of sweet clover at the rate of 21 pounds per acre, sown with rye. In the summer of 1890 the sweet clover was plowed under to a depth of 10 inches with results as shown in the chart.

Conservation of Moisture in the Soil by the Application of Stable Manure

By W. H. Stevenson, Prof. of Agronomy, Iowa State College

Farmers in the arid and semi-arid sections of the country make the conservation of soil moisture an important part of their business. They know that carelessness in saving the moisture of the soil means a crop failure. Farmers in the humid regions are prone to give little thought to the soil moisture problem, other than to remove surplus water by tile drains, and at certain times to earnestly wish for rain.

Neglect to conserve soil water in the Corn Belt does not often bring on a crop failure; very often, however, it reduces crop yields as much as one-half or even more. The farmer of the humid region, as well as the farmer of the semi-arid country, must regard the soil as a reservoir for water, and he must handle the soil in such a way as to keep the reservoir well filled with water. An abundance of water is necessary because when plants grow, they use water. It runs through their stems, is built into their tissues, and is evaporated by the leaves. From 60 to more than 95 per cent of the green weight of our common farm crops is due to water. The ordinary crops require from 200 to 500 pounds of water to produce each pound of dry matter. Corn requires less water per pound of crop produced than other crops. Red clover and oats each require almost twice as much water as corn. If we assume the crop of dry matter in the case of corn to be 4 tons per acre (grain and stover), Professor King shows the amount of water required to produce this yield amounts to 1,088 tons which is equivalent to a rainfall per acre of over nine inches. This is more than one-fourth of the average annual rainfall in Illinois or Iowa. Even in a humid country soils cannot meet the needs of plants for such enormous amounts of water, unless they are under systems of management that tend to conserve moisture.

Aside from irrigation, the average water content of the soil may be increased in two ways: (1) By decreasing losses from percolation and evaporation. (2) By increasing the capacity of the soil for water by increasing the humus content and also by modifying the structure.

Loss from percolation may be prevented in large measure by the use of the roller and other compacting implements which break down the granular arrangement of the soil particles and bring about a greater compactness. This soil condition lengthens the period during which the root zone contains gravitational water, and thus this water may be drawn upon by roots of plants to a greater extent than would be the case if the soil were so open and porous as to permit of the very rapid downward flow of the rainfall.

The loss of water by direct evaporation is often excessive and the result is a reduction in the crop yield. The best way to reduce losses by evaporation is by the preparation of a soil mulch. Almost any soil may be converted into an effective mulch by proper treatment. The most common procedure is to loosen the top soil by stirring frequently with a plow, disk, cultivator or harrow. Sometimes a roller or a harrow is used to break a crust or loosen the top soil in fields that have been seeded to small grain. The latter practice should be followed much more extensively than at the present time. A perfectly dry dust mulch need not be very deep. In practice, it has been found that two or three inches are usually most effective for our common types of soil.

The successful farmer knows that one of the most satisfactory methods of increasing the capacity of his soil for water is by the addition of organic

matter. This material may be in the form of corn stalks, straw, weeds, grasses, crops grown for green manure, such as rye, clover, vetch, cow peas or soy beans, and finally, barn-yard manure. The latter is particularly valuable, in that it adds to the soil considerable quantities of plant food, especially nitrogen, bacteria that help to liberate plant food, and organic matter in excellent mechanical condition. There are about 500 pounds of dry matter in a ton of average manure. It is estimated that if the crops raised on an average corn belt farm are fed and used for bedding in the usual proportions, manure may be produced at the rate of approximately two tons per acre per year. This amount of manure, together with the organic matter that may be secured by plowing under some weeds, grasses and green manure crops, should maintain the organic matter content of the soil at a point that will make for the conservation of a maximum amount of moisture.

Organic matter, especially after it has decomposed to some extent in the soil and taken the form that is known as humus, has a much larger capacity for moisture than has the mineral portion of the soil. It acts as a sponge. It affects the moisture content of the soil by increasing the storage capacity and absorbent power for water. For instance, if different amounts of organic matter are added to sand, the quantity of water retained increases with the increase of organic matter. The following table is taken from Circular No. 82 of the Illinois Experiment Station, and shows the effect of this material upon the retention of water. The test was made in tubes two inches in diameter and eighteen inches long that were filled with sand and peat in the proportions indicated. The same amount of water was added to each tube, and after no more water percolated away, the amount of moisture retained by one hundred grams of the material in each tube was determined.

	Grams of water retained by 100 grams of the mixture
Coarse sand	13.3
Coarse sand with 5% peat	18.6
Coarse sand with 10% peat	24.7
Coarse sand with 20% peat	40.0
Peat	184.0

These data were secured by experiments carried on in the laboratory, but they show the effect that organic matter in the soil mass certainly has from the standpoint of the retention of water. It must be true that an application of 8 or 10 tons of manure per acre will markedly increase the water-holding capacity of the soil. It has been estimated that eight tons of manure, incorporated in the soil is capable of holding about four tons of water. This will increase the water capacity of the surface soil about five tenths per cent. Again, manure affects the moisture capacity through its influence on soil structure, that is, the granular condition of the soil mass. It produces a desirable condition of granulation in clay, and, therefore, increases the moisture capacity. Its addition to sand has a similar, although smaller, effect.

Productive soils in the humid region should contain from 50 to 100 tons of organic matter per acre in the surface zone to a depth of seven inches. Without doubt, a majority of our soils need a larger amount of organic matter than they now contain, to bring them into a state of high productivity. No material is quite as good as barn-yard manure for supplying soils with organic matter. It adds plant food, bacteria and organic matter to the soil. We have learned that the latter constituent plays an exceedingly important role in saving moisture which in time of drought may greatly increase crop yields.

A squeaky wheel is the accuser of a negligent driver



A nine-foot spread by the wide spreading attachment

Good Service is Always Cheaper Than Poor Service

No sooner was the discovery made that manure spread in an even coat over a field would go almost twice as far as the same quantity spread by hand, than there appeared on every side machines advertised as manure spreaders. It is true that there is a certain amount of gain over hand spreading in any machine that does away with the dump board and the pitchfork, but it is just as true that there is more gain in the better spreading and the better service given by machines built not only to spread manure, but to spread it right and to last long enough to pay for themselves.

There is no longer any question that barnyard manure, properly spread, is the most effective fertilizer that can be put on the average field, but properly spread means something more than simply strewing manure over the ground—it means pulverizing the lumps, breaking up the straw, and spreading an even coat, thick or thin, as is desired by the driver, over the whole field. To do this work properly requires a machine built for the purpose, scientifically designed to accomplish the desired result, strong enough in every part to do the work, and yet light enough so that it will not produce undue strain on the horses.

Of the few machines at present on the market which are built up to these specifications, we believe we can safely say that International Harvester manure spreaders come nearer perfection and have made the best records of any. A farmer who buys a spreader without seeing the International Harvester lines makes a mistake, but a farmer who buys a manure spreader without trying an International Harvester machine makes a bigger mistake. Demonstrations of I H C machines are held in so many places that practically every farmer has an opportunity of familiarizing himself with the good points and can see for himself the difference between the service given by an I H C machine and that given by other makes of manure spreaders.

Better spreading produces better crops; the lighter draft makes the work easier for the horses; the efficient pulverizing and even spreading gets the most out of the manure. It has been estimated that every load of manure distributed on the field by an International Harvester manure spreader brings a return in increased crops and fertility of the ground amounting to an average of \$1.50. Compare this with your own experience with other machines and you will see why it pays you to buy the better service that goes with I H C manure spreaders.

*There is pleasure in plowing to the man
who plows with thought and interest*

The Manure Spreader is a Farm Necessity

The manure spreader is vital to the success of a farm, for it is a farm machine that builds up and makes more fruitful the soil upon which the farmer, and then the nation, depend for their livelihood and prosperity.

One needs only glance at a well-kept, prosperous farm to learn that the manure is handled economically by means of a spreader and applied to the soil without loss, and in a quantity best suited to the needs of the soil.

The Bureau of Soils of the United States Department of Agriculture says that the soil, while having a large quantity of plant food or fertilizing elements, requires the application of manure to break up the soil particles and liberate the plant food constituents so that the roots of the plant can assimilate them.

It is advantageous, then, to the farmer to break up just as large a number of the soil particles as is possible. The largest number can be affected by a thin, even coat of manure. The only method of applying the manure in this manner is by means of the manure spreader.

By using a fork the large lumps thrown here and there will give the portions of the soil which they cover more aid in breaking up the particles than is required while the surrounding and uncovered soil will receive no aid, and consequently no change or liberation of the fertilizing elements. The value of the spreader is readily seen and the machine becomes worth several times what it costs for this one advantage alone.

Conservation of moisture in the soil is now being industrially studied by farmers and those interested in agricultural pursuits. A dust mulch secured by frequent cultivation is a method coming into large practice yearly and is one that it will pay every farmer to follow.

The method with which we are immediately concerned and one which the successful farmer knows is extremely practical is to retain the moisture in the soil by the application of manure. There are about 500 pounds of dry matter in a ton of manure. This is convertible to practically an equal amount of organic matter. After it has become decomposed to some extent in the soil and taken the form of humus it has a much larger capacity for moisture than has the mineral portion of the soil. It acts as a sponge. It affects the moisture content of the soil by increasing the storage capacity for water. It has been estimated that 8 tons of manure incorporated in the soil is capable of holding 4 tons of water.

Using a manure spreader, 8 to 10 tons an acre is the average quantity of manure applied. This means 4 tons, or better, of water added or retained for the next crop, in every acre of soil covered, a fact that will mean many dollars added to the crop when the hot summer months otherwise would have their usual deleterious effect.

The manure spreader is the only farm machine that enables the farmer to gratify fully his desire to economize. His idea of economy concerns not only the wise expenditure of money, but the careful conservation of labor, time and material. The spreader saves not only that value in the manure which otherwise would go to waste, but by this saving builds up and conserves the value of the soil. Without the manure the fertility of the soil would be lost and a greater amount of moisture would evaporate. No subsequent expenditure of time and effort could restore the fertility, and the moisture once gone may mean the dearth of the crop.



The calloused hand—not the blistered one—is the hand that achieves

Built on a Solid Foundation

Our experience with harvesting machines began 84 years ago, away back in 1831. In that year the first practical reaper was invented. Very few of the millions of farmers who read this have any distinct recollection of agricultural conditions in this country at that time. Wheat fields were small because there was no way of harvesting large crops. Ninety-seven men out of every one hundred worked in the fields and tilled the soil to secure a scanty subsistence. There was no wheat to export; there was none to store.

Into the midst of these conditions came the inventor of the reaper. He was a farmer who had worked through the 16-hour day harvest time swinging a cradle, gathering sheaves and building shocks. He knew farm work and knew its cost in time and labor. He figured out a way to save that time and labor. He built a practical reaper, which made it possible to grow more wheat and harvest it in season—a machine which would increase the value of farm lands and release an army of men from the drudgery of harvest. The inventor had supreme faith in the future of farming in this country. That his faith was well based and his foresight clear was quickly proved when the first strenuous fight was over. He lived to see his dreams come true in great seas of billowy grain that demanded machines for their harvesting and in the enrichment of the tillers of the soil who used those machines.

Today two-thirds of our people depend absolutely upon the other third for the very bread they eat. Truly, the wheat harvest is everybody's business, a matter of the deepest concern to us all.

The harvesting machine has become the farmer's standby at the critical time when the reward of his season's work is in sight. We have been in this business since the first practical reaper was built. The standard of the past is our standard of the present—only the best machines, durable, dependable, meeting every harvest or hay field condition. You take no risk when you buy harvesting and haying machines bearing the I H C trade-mark and marketed under these names—Champion, Deering, McCormick, Milwaukee, Osborne and Plano.

The experience of many farmers for many years points to one of these machines as the one best buy for a man whose profit lies in the successful harvesting of a grain or hay crop. I H C machines have been tested thoroughly under every harvest field condition, and have made good in every test. You are not asked to make any experiments, the experimenting has all been done. You take no risk, I H C experience has provided against all risks. With an I H C machine you are safe-guarded against all harvesting chances except those of the weather, and very largely against them.

Good harvesting machines require good twine. In order to insure the kind of satisfaction which we insisted upon for our customers, we found it necessary to go into the binder twine business. We now market seven brands all made in Sisal, Standard, Extra Manila, Manila and Pure Manila grades—a complete line of twine for all the harvesting machines we sell.



Harvesting thirty-five acres a day

From Hay Field to Market by Machines

Few phases of farm life lend themselves so completely to the use of machines as the harvesting of hay. From the time when the farmer hitches his team to the mower to the time when the city teamster dumps the hay into his horse's manger every step practically can be performed with some hay tool.

The hay crop, on the whole, is always considered more or less of a side issue, although the fact is it should be considered one of the most important of our farm crops, because it is not only a money-making crop, but a soil-making crop. We are fast learning that a system of live-stock farming and crop rotation is the best means for increasing the yield per acre, at the same time building up the fertility of the soil. All we have to do is to look at those portions of the country which have enjoyed the most permanent prosperity and we see that they are sections in which live stock and grasses have always occupied an important place.

Quality is essential whether hay is to be fed or marketed, and quality is determined by the time in which the hay is cut and the way in which it is cured and cared for. Since there is a definite stage of maturity at which the crop must be cut and since the time is short during which the hay is at this stage, not forgetting that labor is scarce and high-priced, machines which can be operated by one man and a team cutting ten acres a day must be employed instead of one man with a scythe cutting one acre, or ten men with scythes cutting ten acres. The time and labor element also enters into the curing process to a very important degree since the best hay is made without rain and the least possible amount of sunshine. Hay must be raked and loaded gently or the leaves and blossoms will be threshed off and a large part of the nutriment and palatability be thus destroyed.

Before machines were used extensively in making hay, good farmers practiced a system of cutting and curing the crop which produced a quality of hay that has never been excelled. The hay was cut and allowed to dry out to a certain extent and was then raked up and thrown in a small cock where it remained until the curing process was complete. If it had been left just as it was cut, the top hay would have been sun-dried to worthlessness, losing much of its color and nutritive value, while the bottom would have retained too much moisture and would have been musty and unpalatable to the stock. Throwing the hay into loose cocks allowed the air to circulate through it all so that it was thoroughly cured throughout without being sun-burned. It, therefore, retained its rich, green color and all of its strength. From the cocks it was loaded onto the wagon by hand and hauled to the barn. This method has not been improved on as far as the quality of the product is concerned, but by using the right kind of machinery we can eliminate a lot of the time and labor required to produce the same results, and since help cannot be employed in sufficient quantities or at reasonable wages, the use of these machines is essential to make the largest possible profit.



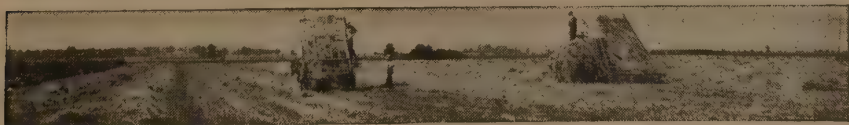
The side delivery rake throws the hay up into light, fluffy windrows where it will air-cure rapidly. This eliminates the necessity for cocking the hay and the time and labor which would have been consumed by this operation can be used in stacking or putting the hay into the barn. When the crop is light two windrows can be thrown together into one larger one. The hay is then in the best possible form to be quickly and easily loaded onto the wagon with a windrow hay loader. By using a side delivery rake and a hay loader, the time and labor required in hay making can be very considerably reduced and both the quantity and quality of your product will be unimpaired.

Due to the advent of the silo, less hay has to be fed on the farm than formerly. In localities where little or no hay is grown, the demand is ever increasing and higher prices are continually being offered. The best markets are, as a rule, found in large cities, and on account of the limited space offered for storage and the fact that it must be in a form compact enough for shipping, this demand is restricted to baled hay. In some cases it has been found that even where hay is fed on the farm many advantages arise from having it baled. The trouble and expense of baling has been reduced to a very small figure by the improvements which have been made in the design and manufacture of presses, and there are now enough types and sizes of these to meet all varying conditions. They are built in one and two-horse styles; also in types so designed that they can be belted to a tractor or portable engine. Another type is a complete outfit in itself, including an oil engine which operates the press through a drive chain.



These power presses will bale anywhere from 15 to 35 tons of average timothy hay in a day, depending on the size of the press, the kind and condition of hay, and the degree of skill exercised by the crew. That there is a big demand for hay is unquestionable, but this demand is limited to hay of good quality and hay which is baled. To cut down the cost of production and turn out a product which will meet the requirements of the buyers at the same time, leaving a sufficient margin of profit to make it worth their while is what every farmer should strive to do. Good machines alone can help them to accomplish this end—machines which give service of the best kind—machines that combine light draft, simplicity, capacity and durability.

The farm is the farmer's factory and whether it is producing butter, milk, grain or hay it must be run efficiently according to up-to-date methods, equipped with up-to-date machinery, turning out a product of good quality in a marketable form, and the farmers who have used their brains and machines in obtaining the best prices have found hay raising well worth their while. The I H C hay machine line is a complete line, including mowers, rakes, side delivery rakes, sweep rakes, stackers, combined sweep rakes and stackers, and swath and windrow loaders. No matter how many acres of hay you raise, no matter what you intend to do with it in the end, you will find that I H C machines increase your margin of profit and facilitate harvesting and marketing the crop.



Don't let your fields get crusty—use the disk

Saving the Entire Corn Crop



From 30 to 40 per cent of the nutritive value of the corn crop is contained in the leaves, husks and stalks. How to get the most out of this 30 to 40 per cent and at the same time perpetuate the producing power of the soil is the question which every farmer who grows corn should consider very carefully.

When the stalks are left standing in the field after the ears have been picked, even though the cattle are turned in to feed in the fall, a large part

of the food value is wasted, much of it being trampled down or left uneaten because it is too fibrous or woody. This method of feeding is doubly unsatisfactory, owing to the difficulty experienced with the uneaten stalks when preparing the fields for the next crop, as they are hard to plow or disk under. When the stalks are cut and fed dry there is not only a waste due to the fact that much will be uneaten, but there is also a loss of food value in the drying process. On the other hand, if the whole crop, ears and all, is cut at the right time and put into the silo, not only is the harvesting expense reasonable, but the full feeding value is preserved and owing to the succulence and palatability the cattle will eat every particle of it and, if the manure is hauled out and spread on the fields again, the maximum amount of soil fertility will be retained.

Countless experiments at the various state and college stations have proved that ensilage is an ideal food when balanced with the proper concentrates. Of late years large beef raisers and general farmers have felt the need of a more economical ration and have turned to ensilage as their salvation. Up to a short time ago beef breeders believed that ensilage was too succulent a ration and that cattle fed much of it would not harden and consequently would be rejected by the packers. This was proved to be a wrong supposition and we now know that the best beef can be produced and the best prices secured by feeding ensilage.

The characteristics of ensilage make it pre-eminently a feed for dairy cattle. It is palatable, succulent, bulky, beneficial to the digestive tract and very economical. In fact, most farmers in the dairy business realize that to secure the best results they must feed it, as ensilage-fed herds do not fall off in milk flow during summer droughts or through long winter months and produce from 11 to 13 per cent more milk than cows fed dry fodder from the same acreage. Contrary to the opinion formerly held, the milk from ensilage-fed cows is not inferior in flavor or odor to the milk from cows dry-fed. Condensed milk companies that formerly did not favor milk from silage-fed cows are now advising their patrons to use ensilage.

Much discussion has arisen concerning the feeding of ensilage to horses. At the outset, a good quality of ensilage absolutely free from mold is required. Some farmers have fed silage to brood mares and horses at rest during the

winter with good results. On the other hand, some have lost horses on account of the mold that ensilage sometimes contains. The Pennsylvania Experiment Station fed ensilage to fattening geldings with quite satisfactory results, but it is hardly to be expected that it would prove sufficient for horses at heavy work.

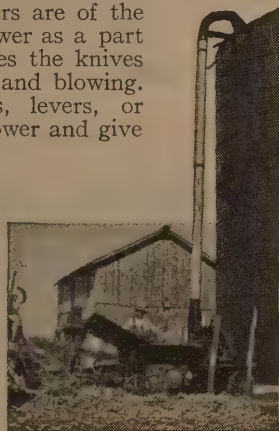
Sheep are natural grazers and suffer most quickly from being changed from rich pasture to dry feed. Ensilage, because it has the palatable nutritive properties of rich pasture, makes the growth of the flock regular and continuous. For breeding ewes it produces a good healthy lamb and a good flow of milk at lambing time. Ensilage used alone forms a nearly perfect balanced ration for sheep and is the cheapest, and, at the same time, the most effective feed that can be used.

Corn, sorghum, clover, alfalfa, cow peas, soy beans, oats, rye, Kafir corn and milo maize are the crops most generally used for making ensilage. Corn is the king of all silage crops as it not only returns a greater yield per acre, but it contains more essential elements that go to make up a satisfactory ration.

To make the margin of profit as great as possible, the farmer must reduce the cost of his ensilage to the lowest possible figure and still not sacrifice its quality. In these days of high-priced labor, it is essential that he should have the best labor-saving machinery, and as the actual filling of the silo is the most important step in the process of ensilage making, he must have a silo filler which will work reliably, handling the corn as fast as it can be cut and hauled to the silo, and requiring the least amount of help to operate it. When you consider that a good ensilage cutter must be built with the idea that to do good work it must be simple, easy to handle, convenient to move about and, above all, ready to withstand the wear and tear of cutting all kinds and conditions of ensilage and blowing it 40 feet or more into the silo, you realize that it is no easy task that the machine has to perform. I H C ensilage cutters are designed with this idea in mind and are built far beyond actual requirements for strength and durability and, consequently, they stand up well under the hardest cutting season. There are many details, such as safety devices, oiling facilities and forms of construction permitting as many as six or eight different lengths of cut which give I H C machines the advantage over others. I H C ensilage cutters are of the "knife on fly-wheel machine" type with the blower as a part of the whole construction. The fly-wheel carries the knives and fan wings and does all the work of cutting and blowing. This requires the fewest possible gears, chains, levers, or other mechanical devices which tend to use up power and give trouble.

You will find that the different sizes and styles in which I H C machines are built make it possible for you to select just the machine for your requirements.

The International line includes four different sizes of machines, all of the blower type. The Belle City line includes four sizes of the blower type, four sizes of power feed cutters, equipped with an elevator for filling silos, and several small hand or power feed cutters.



*It takes moisture to grow crops. The
disk harrow conserves moisture*

Better Crops—1915 Higher Prices

In all the history of the world there never was a time when there was so much profit in sight for farmers. Bumper crops will not reduce prices appreciably this year. Never before was it so necessary or so important to get the most and best out of the ground planted to wheat, oats and other small grains. Never before was good seed bed preparation so imperatively necessary.

Now, if ever, is the time to buy and use the best machines made for disking, harrowing and seeding. Now, if ever, is the time to get posted on the proper preparation of the seed bed and the most profitable planting of small grain. This year you should have not only a bumper crop, but a bumper crop of first quality grain.

Every American farmer who plants small grain this year should use an International Harvester disk harrow named Deering, McCormick, Keystone or Osborne, and use it in the proper preparation of his small grain seed bed. This is no time to put up with cheap tools that do their work in an indifferent manner. I H C tillage implements—the best made—are none too good for the work facing the farmer of 1915.

When the seed bed is ready and is as good as I H C tillage implements alone can make it, the seed should be planted in the least wasteful way and in the way which will produce strong, even germination. No matter what your habit of planting has been this year, use an Empire, Hoosier or Kentucky drill. The advantage of the even spacing of seed, making the most of every square inch of ground; the benefit from planting at an even depth, insuring a strong, even start; the far better chance of a good stand and of even ripening of the grain—all make it worth while to use drills for planting. If it be necessary for you to buy drills, the Empire, Hoosier or Kentucky lines will give you such service and do such good work that you will be away ahead when your 1915 crops are harvested and marketed.



The foundation for a good seed bed



A good grain drill increases the crop yield

The seed bed is the foundation of your profits. Use a good foundation

How the Grain Drill Pays for Itself

The many advantages of seeding with a grain drill, over broadcasting, are so self-evident and have been reiterated such a countless number of times that it seems almost needless to touch upon the subject. Notwithstanding this fact a large percentage of the farmers in the corn belt broadcast their oats on corn stalk ground without making any preparation of the seed bed.

The most satisfactory harvest results are obtained from fields where the seed has been deposited evenly in firm, compact soil and covered at a uniform depth. Neither of these conditions can be brought about in broadcasting, but both are possible when a drill is used.

It is customary when drilling grain to have the rows run as nearly north and south as possible. This permits the rays of the sun to get down to the plant roots. The object of this is readily seen. The warming of the soil around the roots is conducive to a liberal stooling out of the roots and a rapid growth of the grain plant.

Probably the most satisfactory results obtained through drilling the seed is that the crops thus planted withstand both dry and wet weather better than grain that is sowed broadcast. In time of drought the liberal stooling of the drilled plant roots is often the means of saving the crop. It has made it possible for the plants to draw their food supply from far below the surface of the ground. In a wet season the sun and air get to the ground between the rows and the excess moisture quickly evaporates.

Compare this crop assurance with the loss sustained where grain is sowed broadcast. If heavy rains come early, a large portion of the seed is washed out and lost. Knowing that this is likely to happen, more seed is always sowed per acre in broadcasting. Then, if instead of heavy rains, an extremely dry spell comes along even greater trouble is experienced. The grain being extremely thick does not get the strong, sturdy growth that it should have, and the weaker plants soon shrivel up and die.

When the drill is used less seed is required and the crop yield is materially increased. At the Illinois Agricultural Station a three-year trial was made comparing drill seeding of oats with broadcasting. Conditions were the same except that in broadcasting four bushels of oats were sowed per acre while only three were used with the drill. The average yield of the three years was $5 \frac{3}{10}$ bushels more per acre for each year on the drilled ground. Similar tests at other Agricultural Stations show even greater yields in favor of the drill.

Then consider the increased value of the grain per bushel that is grown on the drilled field. The seed is all deposited at an even depth and evenly planted seed has the best chance. It can all come up at the same time. An even growing field means a field that ripens all over at once. It means shocks without a lot of green heads in them. It means a crop with no shriveled kernels, one that grades higher, and that brings a better price on the market.

It is absolutely impossible to cover the seed uniformly when broadcasting. Some seed is sure to be left on the surface for the birds to pick up or for the wind to blow away, and a portion is covered so deep that germination never takes place. With grain selling at the present price, a good drill will pay for itself in one seeding on a forty-acre field by the saving in seed, and by the better yield of grain that proper seeding makes it possible to grow.



The grain drill deposits the seed at an even depth

The Economy of Feeding Ground Feed

Not so very many years ago when land was cheap, when there was plenty of open range in the plains country, and when the demand for food was not nearly as urgent as at present, it was cheaper to graze steers, cows and other farm stock than it was to feed them. Today land values, high prices and the increase in population make it necessary for every farmer in the country to cultivate every square foot of arable land so that its crops will be as large as possible, and to market these crops in the form that will bring him the greatest returns for his investment and labor. We could never afford to waste any of our precious grain crop, and now, more than at any previous time is it necessary that we should not only conserve our food supply, but we also must increase our production so we may be in a position to meet the new demands, and make the most of the consequent advance in prices.

In feeding farm stock there is a great opportunity both to conserve the supply of grain used for this purpose, and also to increase the volume of the product.

Experiments carried on at various government stations, and agricultural colleges, have proved conclusively that farm animals do not masticate their food thoroughly and a large portion of the grain fed passes through the intestinal tract undigested. It does not nourish the animal and is totally wasted. Ground feed, on the other hand, is easily assimilated and converted into beef, pork, milk and horse-power. At the prevailing high market prices of corn and other grain no one can afford to waste any, however small the amount may be. When ground grain is fed it will be found that as much as 35 per cent can be saved. For animals out of condition or old animals, ground grain is essential if the best results would be obtained. It has been thoroughly demonstrated at the leading experiment stations of the country that one pound of corn and cob meal has the same feeding value as one pound of corn meal. This certainly proves that it is well worth while to grind corn on the cob.

International feed grinders are made in several styles and sizes to fit all requirements. They are designed so that they will grind corn on the cob or corn in the husk, as well as small grain, making a very good ration for cows, steers, pigs or horses. The improvements which have been made on these mills from year to year and on the engines which are used to drive them have reduced the cost of grinding to about two cents a bushel. Taking it all in all an International feed grinder will pay for itself in a very short time, by the reduction it makes in the size of your grain bills, and you will find also that you have fatter and healthier stock when you start feeding ground feed.

It Pays to Grind Corn Cobs

The following analysis, under the signature of H. E. Wiley, United States Agricultural Chemist at Washington, D. C., shows the relative values of corn cobs and kernels:

	Cobs	Kernels
Water.....	9.33%	10.49%
Ash.....	1.33%	1.55%
Oil.....	.47%	5.49%
Carbohydrates.....	56.01%	67.72%
Crude fibre.....	30.36%	2.13%
Albuminoids.....	2.50%	10.62%

This analysis shows that corn cobs are of value only as considered from a standpoint of the nutriment they contain. But their value goes beyond this, as they make the ration light and fluffy so that it is more digestible.

The table below, taken from a report (1898) of the New Jersey Experiment Station, shows that the returns from corn and cob meal exceed those from ear

The soil needs air. The spring-tooth harrow aerates it

corn by 9.4 for milk flow and 4.5 in the yield of fat. These returns in favor of grinding corn are not materially different from those secured from fattening steers and swine.

Average Ration		Average daily yield per cow	
		Milk	Fat
Lot I —Ear corn....6 lbs.	Corn stover....10 lbs.		
Wheat bran .6 lbs.	Hay.....9.4 lbs.	20.2 lbs.	0.89 lbs.
Lot II—Corn and cob			
meal.....6 lbs.	Corn stover....10 lbs.		
Wheat bran .6 lbs.	Hay.....9.4 lbs.	22.1 lbs.	0.93 lbs.

Ground Feed vs. Whole Grain

The Michigan Experiment Station carried out an experiment a short time ago to determine the relative feeding value of whole grain and ground feed. The summary of the results of the experiment is as follows:

Whole corn not masticated:

Cows.....	22.75%
Heifers.....	10.77%
Calves.....	6.28%

Whole oats not masticated:

Cows.....	12.06%
Heifers.....	5.48%
Calves.....	2.98%

Whole corn and whole oats not masticated:

Cows.....	26.46%
Heifers.....	17.50%
Calves.....	5.78%

Chemical analyses showed practically the same composition of grain as before feeding; therefore it is safe to conclude that the animal derives no benefit from grain which passes through the digestive tract unmasticated.

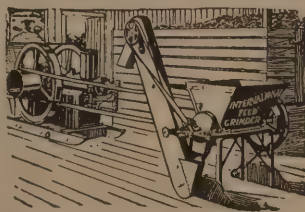
Making Two Cents Save Twelve

About one-fourth of the ear corn you feed is not digested. In the three or four months necessary to bring a steer to market condition, he wastes about three bushels of corn.

The three bushels of wasted corn per steer is worth a dollar and a half to you. For that dollar and a half you can grind seventy-five bushels of feed, none of which will be wasted in feeding.

Grinding costs only two cents a bushel. For every two cents spent in running your grinder you save one-fourth of the price of a bushel of corn. Making two cents save twelve is surely an inviting proposition.

Suppose you ask your local dealer to give you the facts regarding the three types of I H C feed grinders, or, if you prefer, write the Chicago office for a catalogue.



A Convenient Outfit on the Farm

*A stitch in time saves nine—applies to
farm machines. Keep them in repair*

The Feeding Value of Shredded Corn Stover

It is generally agreed among those who have made an exhaustive study of the question that 37 per cent of the feeding value of the corn plant as a whole is contained in the stalks and leaves, 63 per cent representing the ears. This means that if the ear corn on an acre of ground is worth \$25.00 the fodder from the same acre, if put in proper form for feeding, is worth \$15.00. This latter figure represents the loss per acre, an almost absolute loss, if the stalks are left standing in the field for any length of time. Of all the forage crops that grow, none deteriorates more rapidly than corn fodder when exposed to the weather.

Still it is the custom of thousands of cattle feeders to allow their corn stalks to stand in the field all through the cold wintry blasts of rain, sleet and snow. From day to day the frozen and snow-laden stalks are dug from this frigid zone and thrown in the manger for the already overworked digestive apparatus of the bovine herd to wrestle with. The steers are not only expected to eat the frozen mass, but they are expected to build up a strong body as well. No thought is ever taken of the extra energy required to separate the palatable from the unpalatable. But if the animal fails to put on fat it is classed as a "hard keeper."

It should be remembered that under normal conditions a dairy cow uses 20 per cent of the digestive nutriment contained in her food to produce the physical energy that is necessary for doing external work; 43 per cent for keeping up the body, and 37 per cent is used for milk. By normal conditions we mean the using of a correctly balanced ration or as nearly so as possible, and the housing of the animals in warm, well ventilated and well lighted barns. When extremes are reached, proper returns for the food consumed cease. Extra energy is required to counteract extreme conditions. Therefore, if an animal is not properly fed and housed, many dollars are burned in the fire of mismanagement.

An average yield for an acre of corn amounts to from 2 to 3 tons of stover. In the stalks produced on an acre of corn of average quality, there are approximately 85 pounds of protein, 1,500 pounds of carbohydrates, and 22 pounds of ether extract. A steer weighing 1,000 pounds requires daily about five-tenths of a pound of protein, 6 pounds of carbohydrates, and about one-tenth of a pound of ether extract.

From the foregoing figures it is easy to see that there is enough protein contained in an acre of stalks to sustain a steer approximately six months, carbohydrates enough to last ten months, and about enough ether extract to keep him in proper condition eight months. Of course it is not claimed that corn stover is a balanced feed. It is a roughage which holds a very important place in the list of farm feeds, where all crops produced on the farm are fed to the live stock. To make the best feed, corn should be harvested before the leaves are dry and brittle. Frost also reduces the feeding value of the corn crop. For this reason every precaution should be taken to have the corn in the shock before a killing frost arrives.

After the corn is safely in the shock it should not be allowed to stand longer than is absolutely necessary for the stalks to dry thoroughly. As soon as the sap has dried, the stalks should be run through the husker and shredder. The stover should be blown into the mow to protect it against damaging storms which always arrive with the frosty gales of early fall. The losses from these storms are more severe than is generally estimated. Most authorities agree that in the course of a season, storms ruin not less than 25 per cent of the total nutriment contained in the stalks that are exposed to their fury. To a slight extent, loss can be prevented by setting the stalks in large shocks. This re-

Spare the disk and spoil the crop

duces the number of stalks exposed to the weather; therefore lessens the loss caused by washing from showers.

The safer method is to get the stover under shelter as soon as possible. It should always be remembered in considering the shelter problem that shredded fodder occupies less space than stalks stored in an uncut form. Shredded stover is also easier to handle, both in the manger and in the yard.

Feeding tests conducted by the Wisconsin Experiment Station are strongly in favor of shredded fodder. In three separate trials it was proved that approximately 24 per cent of the total value of unshredded fodder is lost and that this loss could be prevented by shredding.

These trials prove conclusively that it pays to shred corn fodder, even though considerable help is required to do the work. A given number of men husking with a machine can do more work in a given number of hours than the same number of men husking by hand. It takes a good man to average 100 bushels of corn per day. When the corn is shocked he falls far short of this average.

With the advent of high prices and scarce and unreliable help, it is absolutely necessary to make every minute count. In many sections time is saved by several farmers banding together and buying a husker and shredder in partnership. Where this method is practiced, the machine is started early in the fall and is never allowed to remain idle until all the partners have their corn safely under cover. By resorting to the exchange of help plan, the cost of husking is reduced to practically nothing. It often happens that after figuring the cost of husking corn at the old rate, the new method—husking with the shredder—leaves the shredded stover as clear gain.

For doing this work, machines are made in sizes suitable for every farm—2, 4, 6, 8, 10 and 12-roll. The smaller machines, 2 and 4-roll, are ideal sizes for individual use. The 6, 8, 10 and 12-roll are made for use on large farms or for clubs of farmers and for doing custom work.

The range of capacity for the various sizes is from 6 to 35 loads of ear corn. Under favorable conditions it is not impossible to husk and shred from 800 to 1,200 bushels of corn per day with the larger machines. Quality of corn and various other conditions enter into consideration, and for this reason it is impossible to say definitely the amount of ear corn a certain size machine will husk.

In closing the shredded stover question, it is well to remember that with hay selling at the present price, shredded corn stover has a feeding value of not less than \$8 per ton. When you revert to the former figures and discover that 24 per cent of the total feeding value contained in a stalk crop can be saved by shredding, you can determine for yourself whether it will pay you to own a husker and shredder.



An I H C Husker and Shredder operated by an I H C Oil Tractor

*Many fortunes are lost by lolling in the
shade instead of scrappin' with the soil*

The Truth About Animal Power



**Hard work is not conducive to raising
high grade colts**

The use of the horse and mule in agriculture dates back to the earliest history. We have become so used to seeing them, reading of them and thinking of them as a motive for farm work that we are inclined to doubt without reason that their usefulness can be dispensed with to great advantage. Sentiment, in a way, is responsible. The horse is an intelligent animal, and the constant contact with him has prejudiced us against a cold-blooded analysis of his usefulness, and yet the figures stand for all to see, prepared by

unprejudiced men who are paid to help the man on the farm reduce his expenses and increase his production.

Many experiments have been made, both by the United States Department of Agriculture and the state institutions, comparing the efficiency of the oil tractor with that of the horse. These figures are often almost startling, and show that man's oldest friend deserved his high standing in society more from the goodness of his heart than from his ability. For instance, the food one takes is turned into heat, and this heat provides the energy which keeps one going. It has been found that the oats and hay which a horse consumes generate heat, according to the rule, but that thirty per cent of the heat value of this food is used up by the animal in merely chewing and digesting it. At the same time, other duties which the horse must necessarily perform, such as carrying its own weight, consume so large a proportion of the remainder of this food that the authorities claim the thermal efficiency of the horse is not more than six to ten per cent. This is true under ideal conditions. It is even lower in animals which are unscientifically fed. It would seem, therefore, that out of every one hundred bushels of oats eaten, a horse delivers only six to eight bushels worth of horse power.

Another interesting fact is that the average life of a horse is short. He lives in all about 90,000 hours. Of this 90,000 hours, it is estimated that he works approximately 10,000 hours. Hence, throughout his career he is being fed nine hours for every one hour of service which he gives.

Added to all of this, the horse is a good eater. To feed him requires the produce from one out of every five acres. Hence a farmer is obliged to use up one-fifth of the land which the horse cultivates in paying for the power which he provides. In spite of his cost of board and lodging, the horse has increased in numbers during the last ten years practically fifty per cent, and during the same time it has doubled in price.

Owners of large areas of land felt the need of mechanical power before the smaller farmers, and it was with big farms in view that the early internal combustion tractors were designed. It was soon seen, however, that the farmers of smaller tracts differed from large owners only in degree, and the trend of tractor construction was to develop a small sized tractor for medium sized farms. Tractor farming has now reached the stage where it is believed that every farmer tilling 160 acres or more could invest in one with profit to himself. There is indeed a crying need for power, particularly in the old es-

established regions where farms need deeper plowing, more cultivating, more uniform seeding, and speedier harvests. Every move, practically, on the farm requires power; each move requires time; and in the cost of raising a crop, time and power mean money. A horse averages about sixteen cents every hour it works. Each pair of horses require the attention of one man whose time is worth from fifteen cents to forty cents each hour he works. It is the saving of time and labor which primarily makes a tractor profitable. It is the preparing of the seed bed, such as deeper plowing, more frequent cultivation, and uniform planting, which constitutes the secondary value, by making the returns greater from each acre.

Contrasted with the horse, a small tractor—say 12-25-H. P.—will pull a gang of four or five plows two miles an hour for twenty-four hours a day without resting at the furrow's end or stopping for food. A horse at its best can pull a load only about fifteen miles per day, and yet it requires a walk of sixteen miles to plow two acres. A tractor will not only plow, but it will harrow and seed from ten to twenty acres each day, and in so doing requires only one man's attention. It will double disk in one operation. Three seeders behind it is only a moderate load. A swath of twenty-four feet can be cut with three binders behind it, and at the time of threshing it will easily handle 200 bushel of oats per hour, and in marketing, five tons at one trip is a moderate load.

There are tractors in the market which weigh less than six horses and yet will do the work of twelve. They have the advantage in that where it has been customary to feed a horse, give him comfortable quarters, keep him clean, and supply an immense storehouse for his food, a tractor requires only a shed, an oil can, and cotton waste. It has a running expense only when it is running. When the engine is shut off this cost ceases. It has an extra virtue in that it cannot contract diseases, catch cold, nor take sick and die.

There are places where a horse can go and a tractor cannot. Then again, there are many tasks for which horses are unfitted, such as threshing, cutting ensilage, irrigating, husking and shredding, grinding feed, and making roads, which are every-day sports for an engine. Like all revolutions of great moment in commerce, the changes are slow. Farmers act as individuals rather than a mass, but so many are learning that by using a tractor in place of horses they can save a little money on plowing, a little more on hauling, still more on seeding, more yet on harvesting and hauling to market, that the tractor is fast becoming a common sight in all parts of the country. It is good business thinking on the part of the farmer, because if he can save twenty cents in the production of a bushel of wheat, he is making as much on that wheat if the market is eighty cents as his less efficient neighbor is making were the market value \$1.00. Manufacturers early found that the selling price did not so much determine profits as did the cost of production. This truth holds good with a bushel of corn as consistently as it does when applied to shoes. Efficiency on the farm is as important as efficiency in the factory. Hence the farm workers who adopt the most effective time and labor-saving methods in raising their crops will in the end probably find themselves the most successful money-making farmers.



The oil tractor does the hard work at less cost than horses

*Prosperous farmers use up-to-date farm machines—
That's why they are prosperous*

The Agricultural Extension Department

The Agricultural Extension Department of the International Harvester Company of New Jersey aims to help farmers. The work is carried on by going direct to the people, and explaining to them better methods. Educational literature and the loaning of Lecture Charts and Lantern Slides is also part of the work. Charts or slides are furnished to city and county superintendents of schools, teachers, state agricultural leaders, county agents, chautauquas, farmers' institutes, granges, etc. The list includes the following subjects:

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